Fuji Electric

Innovating Energy Technology

CONTROL

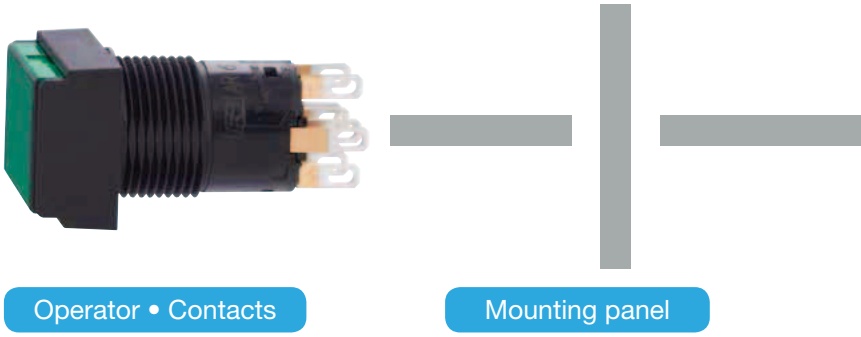
Command Switches Integrated contact structure

AR15C•DR15C, AF15C•DF15C series
AR16C•DR16C, AF16C•DF16C series

62E1-E-0119a

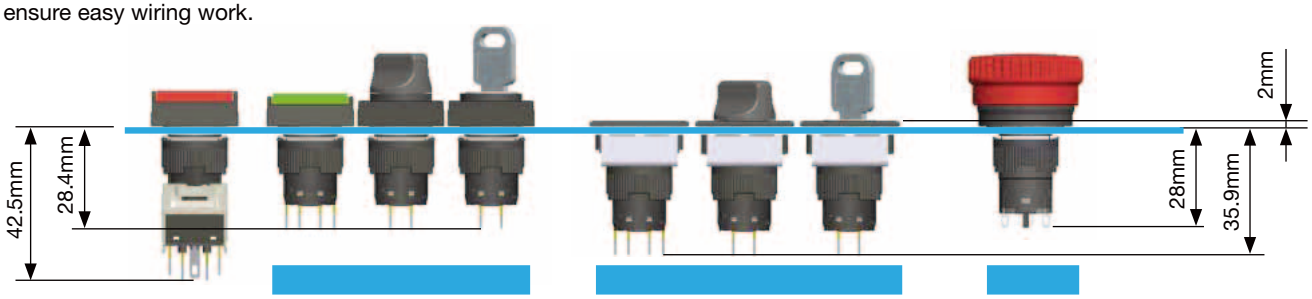
Ø16 Command Switches
AR15C•DR15C, AF15C•DF15C series
AR16C•DR16C, AF16C•DF16C series

- An integrated structure with built-in contacts that can reduce control panel depth.
- A wide variety of sockets are available to simplify wiring.



Supporting smaller and thinner operator's panels

A structure that integrates operator and contacts to reduce panel-mounting depth. Terminals extending to the rear of the switch ensure easy wiring work.



AH164, 5 series (Contact separated type)

AR15C · DR15C series
AR16C · DR16C series
(Standard type)

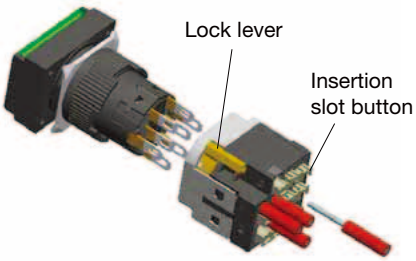
AF15C · DF15C series
AF16C · DF16C series
(Thin type)

AR16V series
(Emergency stop pushbutton switches)

A wide variety of sockets reduce wiring work

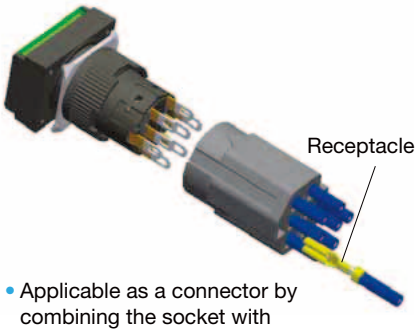
Switches combine with a variety of sockets to simplify wiring.

● Fast-connection socket



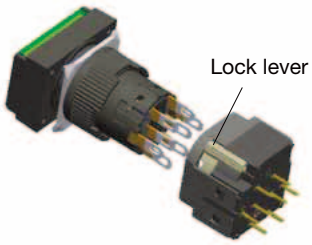
- Applicable as a fast-connection terminal switch by combining the socket with a switch.
- Easily wired by simply removing the wire sheath and inserting the wires while pressing the insertion slot button (no soldering required).
- Incorporates a branch terminal for easy branching.

● Connector socket

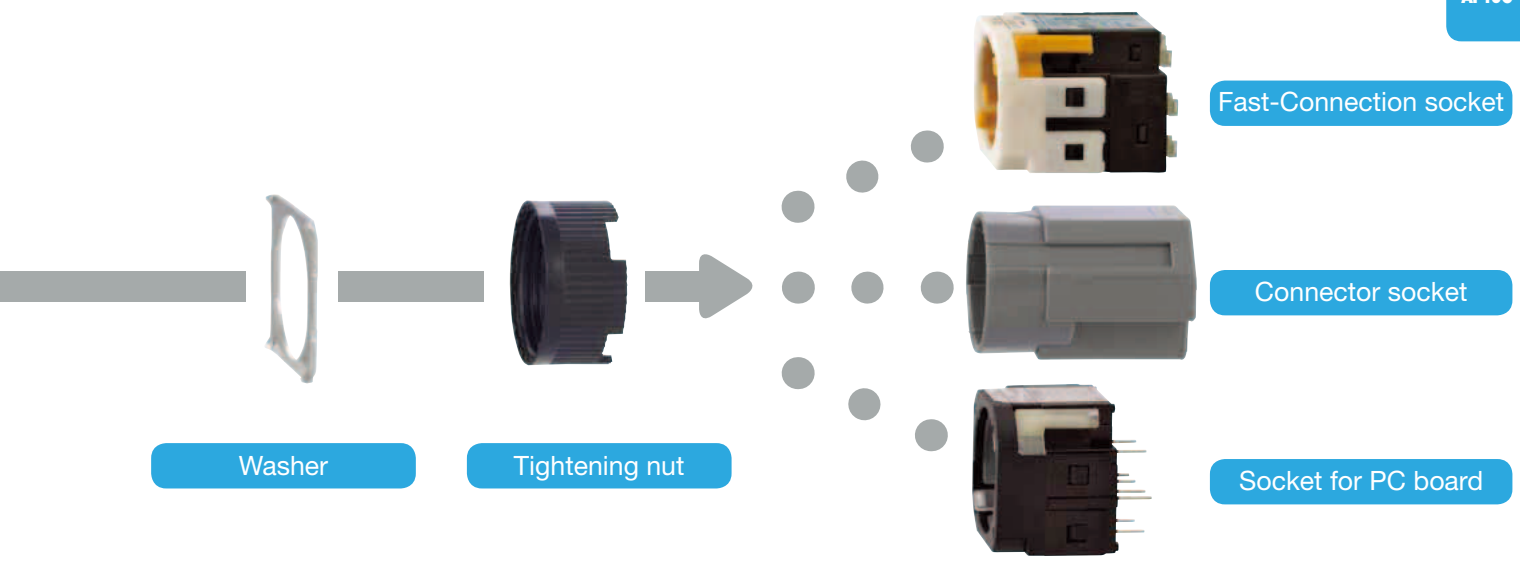


- Applicable as a connector by combining the socket with receptacles.
- The socket holds the receptacles, making it easy to connect the receptacle to the switch with a single operation.

● Socket for PC board



- Applicable as a switch for PC board by combining the socket with a switch.
- Pattern wiring reduces the number of wiring man-hour and helps prevent faulty wiring.



Contributes to attractive panel designs

In addition to the standard type, a thin type with a panel protrusion of only 2 mm is available, allowing high-density mounting for attractive panel designs.

Integrated contact structure(Thin type)
AF15C · DF15C, AF16C · DF16C series

- Keep in mind that the panel cutout size for the thin type depends on the operator shape.

Degrees of protection

With regard to the degree of protection, AR15C・AF15C series which met the requirements of IP40 of IEC 60529, and AR16C・AF16C series which meet the requirements of IP65 of the said, are available. This permits the application to various fields, from machine tools to OA(Office Automation) facilities.

IP40 : AR15C・DR15C, AF15C・DF15C
IP65 : AR16C・DR16C, AF16C・DF16C

Highly reliable contact mechanism

Gold-plated contacts and a snap-action mechanism enables IC-level applications (with a switching current of 1 mA at 5 V).

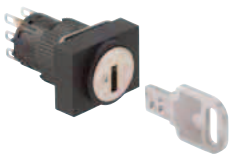
Meets EU RoHS requirements

Standard models meet RoHS requirements
(EU Directive 2002/95/C).

Standard models meet international standards

Standard models meet UL/CSA requirements, China Compulsory Certification (CCC) standards, and TÜV EN standards, making them ideal for equipment for export.

The insertion/extraction life of the key is greatly extended



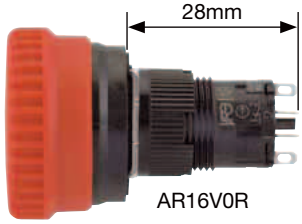
The key selector switch incorporates a pin tumbler type key (reversible type) to improve the insertion/extraction performance of the key.

- Six key types are available.
- The pin tumbler construction improves security.

Emergency stop pushbutton switches

The AR16V types feature a panel depth dimension of 28 mm for non-illuminated models and can have up to four sets of contacts.

Non-illuminated



AR16V0R

Illuminated

AR16V0L

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Catalog Disclaimer
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The products identified in this catalog shall be sold pursuant to the terms and conditions identified in the "Conditions of Sale" issued by Fuji Electric FA with each order confirmation.

Except to the extent otherwise provided for in the Conditions of Sale issued by Fuji Electric FA, Fuji Electric FA warrants that the Fuji Electric FA products identified in this catalog shall be free from significant defects in materials and workmanship provided the product has not been: 1) repaired or altered by others than Fuji Electric FA; 2) subjected to negligence, accident, misuse, or damage by circumstances beyond Fuji Electric FA's control; 3) improperly operated, maintained or stored; or 4) used in other than normal use or service. This warranty shall apply only to defects appearing within one (1) year from the date of shipment by Fuji Electric FA, and in such case, only if such defects are reported to Fuji Electric FA within thirty (30) days of discovery by purchaser. Such notice should be submitted in writing to Fuji Electric FA at 5-7, Nihonbashi Odemma-cho, Chuo-ku, Tokyo, Japan. The sole and exclusive remedy with respected to the above warranty whether such claim is based on warranty, contract, negligence, strict liability or any other theory, is limited to the repair or replacement of such product or, at Fuji Electric FA's option reimbursement by Fuji Electric FA of the purchase price paid to Fuji Electric FA for the particular product. **Fuji Electric FA does not make any other representations or warranties, whether oral or in writing, expressed or implied, including but not limited to any warranty regarding merchantability or fitness for a particular purpose.** Except as provided in the Conditions of Sale, no agent or representative of Fuji Electric FA is authorized to modify the terms of this warranty in writing or orally.

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Safety precautions

- This catalog aims at offering reference information on selecting and purchasing Fuji Electric FA' s electrical devices and components.
- Prior to installation, wiring, operation, maintenance and inspection of the product, read through the Instruction Manuals and/or User's Manuals to ensure proper use of the product. Improper use may result in death or serious injury.
- If you have any question or require further detailed information on this catalog, consult with your local dealership or Fuji Electric FA.
- Observe the following precautions for safe operation of the products contained in the catalog.

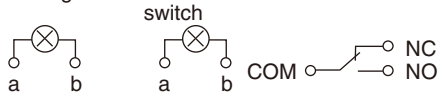
⚠ WARNING

Power supply must be turned OFF before installation, de-installation, wiring, maintenance and inspection.
Never touch any live parts such as terminals while the power is turned ON.
Electrical shock or short-circuit may result in burn, death, or serious injury.

⚠ CAUTION

- Do not transport the products in the method other than those specified. Do not use the products if any damage or deformation is discovered when unpacked. Fire, malfunction or failure may result.
- Do not give the products a shock by falling or toppling during transportation or unpacking. Damage or failure may result.
- Installation, electrical work, electrical wiring, maintenance and inspection should be conducted by qualified personnel with professional knowledge.
- Operate (Store) in the environment specified in the Instruction Manuals and/or User's Manuals. Do not install the products in the abnormal environment such as high temperature, high humidity, dew condensation, dust, corrosive gases, organic solvents, special oil, excessive vibration or shock. Fire, malfunction, electrical shock, or failure may result.
- Use the products at the rated voltage and current specified in the Operating Instructions and/or User's Manuals. Using beyond the rated values may result in grounding, short-circuit, fire, explosion, failure, or malfunction.
- Install the products according to the directions described in the Operaitng Instructions and/or User' s Manuals. Improper mounting may cause falling, malfunction, or failure, and result in injury.
- Select wire sizes suitable for the applied voltage and thermal current. Tighten with the torque specified in the Operating Instructions. Improper wiring may result in fire.
- Special care should be taken to prevent entry of foreign objects such as dust, concrete chips, iron powder, wire chips, etc. Poor contacts, defective release action, fire, or malfunction may result.
- Periodically make sure the terminal screws and mounting screws are securely tightened. Operation at a loosened status might cause fire or malfunction.
- Attaching the live part protective covers is recommended. Otherwise, it may result in an electric shock to the operator.
- Be sure to install the electrical wiring correctly and securely, observing the operating instructions and manual. Wrong or loose wiring might cause fire, accidents, or failure. Never conduct any repair on-site. Please ask your Fuji Electric FA representative for repair. Fire, accidents, or failure may result.
- Before cleaning, first turn the power OFF, use towels twisted to be dry after soaked with warm water. Use of diluents or other organic solvents may dissolve or discolor the product surface.
- Do not remodel or disassemble the products. Failure may result.
- The products should be treated as industrial wastes when they are to be discarded.
- The products contained in this catalog have been designed and manufactured as general-purpose products for general industry. Customers, who intend to use the products for such equipment or systems that may affect human lives, are requested to prepare safety measures together with other safety devices.
- Customers, who intend to use the products described in this catalog, for special applications such as for nuclear energy control, aerospace, medical, or transportation, please consult your Fuji Electric FA agent.
- Customers, who intend to use the products for such applications or systems that may lead to loss of human lives or serious damage to facility in the event of the products' failure, are requested to provide safety measures by all means.
- The information contained in this catalog is subject to change without prior notice.

Glossary

Classification	Term	Explanation
Rating	Rated insulation voltage (Ui)	A voltage value that serves as a reference when designing a device and satisfies the clearance and creepage distance and the withstand voltage (dielectric strength) of the device.
	Rated operational voltage (Ue)	A voltage value applied to a device under specified conditions.If the device is a control switch, the rated operational voltage (Ue) in combination with the rated operational current determines the equipment that it is to be applied to. Furthermore, the rated operational voltage (Ue) determines the relevant tests and operating load type of the control switch.If the control switch is an illuminated type, the term "lamp operational voltage" is applied in this catalog in order to distinguish it from the rated operational voltage of the switch.
	Rated impulse withstand voltage (Uimp)	This is the peak value of an impulse voltage that has a specified waveform and polarity and that is capable of being withstood by a device under specified test conditions, and serves as a reference for clearance.
	Conventional free air thermal current (Ith)	The maximum value for an electric current used to test the temperature rise of a control switch.
	Rated operational current (Ie)	An electric current applied under specified conditions.
Operating environment	Pollution degree	A factor used for determining the clearance and creepage distance of a device. There are four pollution degrees according to the pollutants in the operating environment, such as the dust in the air. Fuji's Command Switches are applicable to pollution degree 3. Pollution degree 3 refers to the occurrence of conductive pollution or the occurrence of conductivity as a result of condensation, but the occurrence of dry, nonconductive pollution in normal, dry conditions. It applies to environments typical of manufacturing plants.
Degree of protection	IP code	The IP code stipulates the degree of protection of a device provided by its enclosure against the ingress of solid matter and water according to IEC 60529. The IP code is expressed with the code letters IP (Ingress Protection) followed by two digits. The first characteristic digit indicates the degree of protection against the ingress of solid foreign objects. The second characteristic digit indicates the degree of protection against the ingress of water.
Types of pilot lights and illuminated switches	Pilot lights without transformer Illuminated switch without transformer	A pilot light or illuminated switch designed so that the voltage of the electric circuit can be applied directly to the light source. Ex. Pilot light Illuminated switch  Note: The terms of a, b, COM, NC and NO indicate the terminal numbers
Operational functions	Momentary	The contacts operate when the pushbutton is pressed and automatically reset when the pushbutton is released.
	Alternate	The contacts operate when the pushbutton is pressed and the actuated state is held (locked) when the pushbutton is released. The contacts are reset when the pushbutton is pressed again.
	Maintained	The knob (key) of selector switch is operated and reset by hand. The contacts are interlocked according to each knob (key) operation.
	Spring return	The knob (key) of the selector switch and the contacts are automatically reset to the normal position if the knob (key) is released while the knob (key) is being actuated.
	Spring/manual return	Manual and automatic knob (key) resetting methods combined and applied to three-notch selector switches.

■ Standard type

● Illuminated pushbutton switches

Operator	Flush rectangular				Flush rectangular with guard			
Degree of protection (Operator)	IP40		IP65		IP40		IP65	
Operator action	Momentary	Alternate	Momentary	Alternate	Momentary	Alternate	Momentary	Alternate
Type	**AR15F0NC**	**AR15F5NC**	**AR16F0NC**	**AR16F5NC**	**AR15G0NC**	**AR15G5NC**	**AR16G0NC**	**AR16G5NC**
Appearance								

Operator	Flush square				Extended round			
Degree of protection (Operator)	IP40		IP65		IP40		IP65	
Operator action	Momentary	Alternate	Momentary	Alternate	Momentary	Alternate	Momentary	Alternate
Type	**AR15F0MC**	**AR15F5MC**	**AR16F0MC**	**AR16F5MC**	**AR15E0LC**	**AR15E5LC**	**AR16E0LC**	**AR16E5LC**
Appearance								

● Pushbutton switches

Operator	Flush rectangular				Flush rectangular with guard			
Degree of protection (Operator)	IP40		IP65		IP40		IP65	
Operator action	Momentary	Alternate	Momentary	Alternate	Momentary	Alternate	Momentary	Alternate
Type	**AR15F0TC**	**AR15F5TC**	**AR16F0TC**	**AR16F5TC**	**AR15G0TC**	**AR15G5TC**	**AR16G0TC**	**AR16G5TC**
Appearance								

Operator	Flush square				Extended round			
Degree of protection (Operator)	IP40		IP65		IP40		IP65	
Operator action	Momentary	Alternate	Momentary	Alternate	Momentary	Alternate	Momentary	Alternate
Type	**AR15F0SC**	**AR15F5SC**	**AR16F0SC**	**AR16F5SC**	**AR15E0RC**	**AR15E5RC**	**AR16E0RC**	**AR16E5RC**
Appearance								

● Pilot lights

Operator	Flush rectangular		Flush square	
Degree of protection (Operator)	IP40	IP65	IP40	IP65
Type	**DR15F0NC**	**DR16F0NC**	**DR15F0MC**	**DR16F0MC**
Appearance				

Operator	Extended round		Dome	
Degree of protection (Operator)	IP40	IP65	IP40	IP65
Type	**DR15E0LC**	**DR16E0LC**	**DR15D0LC**	**DR16D0LC**
Appearance				

Command Switches

AR15C • DR15C, AF15C • DF15C
AR16C • DR16C, AF16C • DF16C
Selection guide

● Selector switches (Knob type)

Operator	Knob with rectangular bezel		Knob with square bezel		Knob with round bezel	
No. of position	2-position, 3-position		2-position, 3-position		2-position, 3-position	
Operator action	Maintained, Spring/manual return, Spring return		Maintained, Spring/manual return, Spring return		Maintained, Spring/manual return, Spring return	
Degree of protection (Operator)	IP40	IP65	IP40	IP65	IP40	IP65
Type	**AR15PTC**	**AR16PTC**	**AR15PSC**	**AR16PSC**	**AR15PRC**	**AR16PRC**
Appearance						

● Selector switches (Key type)

Operator	Key with rectangular bezel		Key with square bezel		Key with round bezel	
No. of position	2-position, 3-position		2-position, 3-position		2-position, 3-position	
Operator action	Maintained, Spring/manual return, Spring return		Maintained, Spring/manual return, Spring return		Maintained, Spring/manual return, Spring return	
Degree of protection (Operator)	IP40	IP65	IP40	IP65	IP40	IP65
Type	**AR15JTC**	**AR16JTC**	**AR15JSC**	**AR16JSC**	**AR15JRC**	**AR16JRC**
Appearance						

● Emergency stop illuminated pushbutton switches

Operator	Illuminated push-lock (32mm dia)	Illuminated push-lock (40mm dia)
Operator action	Turn reset or pull reset	Turn reset or pull reset
Degree of protection (Operator)	IP65	IP65
Type	**AR16V0L**	**AR16V1L**
Appearance		

● Emergency stop pushbutton switches

Operator	Push-lock (32mm dia)	Push-lock (40mm dia)
Operator action	Turn reset or pull reset	Turn reset or pull reset
Degree of protection (Operator)	IP65	IP65
Type	**AR16V0R**	**AR16V1R**
Appearance		

■ Thin type

● Illuminated pushbutton switches

Operator	Flush rectangular				Flush square			
Degree of protection (Operator)	IP40		IP65		IP40		IP65	
Operator action	Momentary	Alternate	Momentary	Alternate	Momentary	Alternate	Momentary	Alternate
Type	**AF15F0NC**	**AF15F5NC**	**AF16F0NC**	**AF16F5NC**	**AF15F0MC**	**AF15F5MC**	**AF16F0MC**	**AF16F5MC**
Appearance								

Operator	Flush round			
Degree of protection (Operator)	IP40		IP65	
Operator action	Momentary	Alternate	Momentary	Alternate
Type	**AF15F0LC**	**AF15F5LC**	**AF16F0LC**	**AF16F5LC**
Appearance				

● Pushbutton switches

Operator	Flush rectangular				Flush square			
Degree of protection (Operator)	IP40		IP65		IP40		IP65	
Operator action	Momentary	Alternate	Momentary	Alternate	Momentary	Alternate	Momentary	Alternate
Type	**AF15F0TC**	**AF15F5TC**	**AF16F0TC**	**AF16F5TC**	**AF15F0SC**	**AF15F5SC**	**AF16F0SC**	**AF16F5SC**
Appearance								

Operator	Flush round			
Degree of protection (Operator)	IP40		IP65	
Operator action	Momentary	Alternate	Momentary	Alternate
Type	**AF15F0RC**	**AF15F5RC**	**AF16F0RC**	**AF16F5RC**
Appearance				

● Pilot lights

Operator	Flush rectangular		Flush square	
Degree of protection (Operator)	IP40	IP65	IP40	IP65
Type	**DF15F0NC**	**DF16F0NC**	**DF15F0MC**	**DF16F0MC**
Appearance				

Operator	Flush round	
Degree of protection (Operator)	IP40	IP65
Type	**DF15F0LC**	**DF16F0LC**
Appearance		

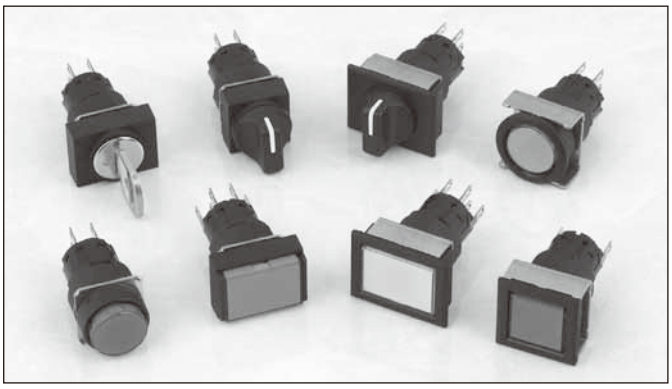
● Selector switches (Knob type)

Operator	Knob with rectangular bezel		Knob with square bezel		Knob with round bezel	
No. of position	2-position, 3-position		2-position, 3-position		2-position, 3-position	
Operator action	Maintained, Spring/manual return, Spring return		Maintained, Spring/manual return, Spring return		Maintained, Spring/manual return, Spring return	
Degree of protection (Operator)	IP40	IP65	IP40	IP65	IP40	IP65
Type	**AF15PTC**	**AF16PTC**	**AF15PSC**	**AF16PSC**	**AF15PRC**	**AF16PRC**
Appearance						

● Selector switches (Key type)

Operator	Key with rectangular bezel		Key with square bezel		Key with round bezel	
No. of position	2-position, 3-position		2-position, 3-position		2-position, 3-position	
Operator action	Maintained, Spring/manual return, Spring return		Maintained, Spring/manual return, Spring return		Maintained, Spring/manual return, Spring return	
Degree of protection (Operator)	IP40	IP65	IP40	IP65	IP40	IP65
Type	**AF15JTC**	**AF16JTC**	**AF15JSC**	**AF16JSC**	**AF15JRC**	**AF16JRC**
Appearance						

■ Features



- An integrated operator component and contact mechanism that reduces control panels' depth. A unified depth of 28.4mm for the Standard type and 35.9mm for the Thin type.
- Thin type and Standard types available for your control panel design. Select an optimum one to match your control panel design.
- A wide variety of sockets help to reduce wiring.
- Incorporating a gold-flashed SPDT or 2PDT contact mechanism with a snap-action structure that makes and breaks 1mA at 5V.
- A key selector switch with a pin tumbler key and reversible-type mechanism provides improved key insertion and removal (extraction) performance.
- Complies with RoHS (EU Directive 2002/95/EC).
- The standard models are approved by UL/CSA, CCC and TÜV (EN standard).
- Bearing CE markings.

■ Contact ratings

• UL/CSA

• AC (COS ø = 0.35)

Contact rating code	120V		240V	
	Making current	Breaking current	Making current	Breaking current
D300	3.6A	0.6A	1.8A	0.3A

• TÜV (EN60947-5-1), CCC (GB14048-5), JIS C 8201-5-1

Type of switches	Conventional free air thermal current Ith	Rated operational current Ie				
		Rated operational voltage Ue	AC		DC	
			AC-13 (Inductive load)	AC-12 (Resistive load)	DC-13 (Inductive load)	DC-12 (Resistive load)
Illuminated pushbutton switch Pushbutton switch Selector switch	5A	24V	–	–	0.7A *1	1A
		120V	1A	1.5A	–	–
		125V	–	–	0.15A *1	0.2A
		240V	0.7A	1A	–	–

Note: *1 $T_{0.95}$=21ms

■ Specifications (indoor use)

Item		Illuminated pushbutton switch, pushbutton switch	Selector switch	Pilot lights
Rated insulation voltage Ui		250V AC/DC		
Durability	Mechanical	Momentary action: 1 million operations Alternate action: 250,000 operations	Maintained: 250,000 operations Spring/manual return: 250,000 operations Spring return: 250,000 operations	–
	Electrical	100,000 operations (at 220V AC 0.7A)		–
Operating frequency		1200 operations/hour (On-load factor: 40%)		–
Withstand voltage	Between live section and grounding	2000V AC, 1 minute		
	Between opposite polarity live sections	2000V AC, 1 minute		–
Insulation resistance		100MΩ or more (500V DC megger)		
Rated impulse withstand voltage Uimp		2.5kV		
Conditional short-circuit current		1000A		
Short-circuit protective device		gG 2A (IEC60269 Fuse)		
Pollution degree		3		
Vibration		Resonance: frequency 10 to 55Hz, double amplitude 1.0mm Constant: frequency 16.7Hz, double amplitude 3mm		
Shock		Malfunction durability; 100m/s^2 Mechanical durability; 500m/s^2		
Operational ambient temperature		–10 to +55°C (no icing or no condensation)		
Storage temperature		–40 to +70°C		
Relative humidity (inside control panel)		45 to 85%RH (–5 to + 40°C) (no icing or no condensation)		
Degree of protection of operating (displaying) section		AR15C • DR15C, AF15C • DF15C : IP40 (IEC60529) AR16C • DR16C, AF16C • DF16C : IP65 (IEC60529)		
Degree of protection of terminal section		IP2X (Fast-connection socket: AR6S690, Connector socket: AR6S691-C or Terminal cover: AR2Y261, At the connection)		

■ Specifications (Socket)

Ietm	Fast-connection socket	Connector socket	Socket for PC board
Rated insulation voltage Ui	250V AC/DC		60V AC/DC
Conventional free air thermal current Ith	3A	5A	3A
Rated impulse withstand voltage Uimp	2.5kV		0.5kV
Withstand voltage (Between live section and grounding)	2000V AC, 1minute		1000V AC, 1minute
Insulation resistance	100MΩ or more (500V DC megger)		
Operational ambient temperature	–10 to +55°C (no icing or no condensation)		
Storage temperature	–40 to +70°C		
Relative humidity	45 to 85%RH (–5 to + 40°C) (no icing or no condensation)		
Pollution degree	3		

■ Contact reliability

FUJI has confirmed that the product can be used in 1mA circuit conditions at 5V AC or DC. The operable range, however, may vary depending on the operational ambient conditions and type of load.

■ Lamp ratings and current consumption

• Illuminated pushbutton switch, Pilot lights

Applied method	Lamp operational voltage	High-brightness LED lamp		
		Type	Lamp rated voltage	Current consumption
without transformer	12V DC	**DR6L695C-B□**	12V DC	Green, Red, Amber, Blue: 9 to 10.5mA DC White: 4.5 to 5.5mA DC
	24V DC	**DR6L695C-E□**	24V DC	

Note: A box □ indicates the luminous color. For details, see the “Combination of Illuminated pushbutton / pilot light color and LED lamp luminous color”.

■ Combination of Illuminated pushbutton / pilot light color and LED lamp luminous color

Illuminated pushbutton / pilot light color (lens color)		Luminous color of high-brightness LED lamp	
	Type		Type
Green	G	Green	**DR6L695C- ■ G**
Red	R	Red	**DR6L695C- ■ R**
White	W	White	**DR6L695C- ■ P**
Yellow	Y	White	**DR6L695C- ■ P**
Orange	A	Amber	**DR6L695C- ■ A**
Blue	S	Blue	**DR6L695C- ■ S**

Note: *1 A box ■ indicates the lamp operational voltage. For details, see the “Lamp ratings and current consumption”.

■ LED durability

Type of lamp	Durability(reference)	Judgment criterion
LED lamp	Approx. 30000h	When the brightness is less than 50% of initial value.

Note: The durability of LED lamp is a mean value in all colors.

■ Standard approved

UL508	cUL File No.E44592
CSA C22.2 No.14	
TÜV: EN60947-5-1	Pushbutton, Illuminated pushbutton: R50116757 Selector: R50116759 Pilot lights: R50116762
CCC: GB14048.5	Switches (except pilot lights): 2013010305590653 Pilot lights: 2013010305590652

■ Standard models approved by international standards

The standard models of AR15C • DR15C, AF15C • DF15C series and AR16C • DR16C, AF16C • DF16C series of the ø16 Command Switches meet UL / CSA requirements, China Compulsory Certification (CCC) standards, and TÜV EN standards, thus ensuring easier direct or indirect export to North America and European countries with no safety standard concerns.

Type number nomenclature

• Illuminated pushbutton switches

AR16 F0NC – C2 E3 G

Product category

Category	Degree of protection	Code
Standard type	IP40	**AR15**
	IP65	**AR16**
Thin type	IP40	**AF15**
	IP65	**AF16**

Operator shape and action

Operator shape	Code			
	Standard type		Thin type	
	Momentary	Alternate	Momentary	Alternate
Flush rectangular	**F0NC**	**F5NC**	**F0NC**	**F5NC**
Flush rectangular with guard	**G0NC**	**G5NC**	**–**	**–**
Flush square	**F0MC**	**F5MC**	**F0MC**	**F5MC**
Extended round	**E0LC**	**E5LC**	**–**	**–**
Flush round	**–**	**–**	**F0LC**	**F5LC**

Contact arrangement and terminal

Contact arrangement	Code	Type of terminal
SPDT	**C1**	Tab (#110) and solder dual-use terminal
2PDT	**C2**	

Color of button

Color	LED color	Code
Green	Green	**G**
Red	Red	**R**
White *1	White	**W**
Yellow	White	**Y**
Orange	Amber	**A**
Blue	Blue	**S**

Note: The button is transparent in color.
*1: A combination of the transparent lens and the white legend plate comes to white.

Lamp operational voltage and light source

Applied method	Voltage	Code
		LED
Without transformer	12V DC	**B3**
	24V DC	**E3**

• Pushbutton switches

AR16 F0TC – C2 R

Product category

Category	Degree of protection	Code
Standard type	IP40	**AR15**
	IP65	**AR16**
Thin type	IP40	**AF15**
	IP65	**AF16**

Operator shape and action

Operator shape	Code			
	Standard type		Thin type	
	Momentary	Alternate	Momentary	Alternate
Flush rectangular	**F0TC**	**F5TC**	**F0TC**	**F5TC**
Flush rectangular with guard	**G0TC**	**G5TC**	**–**	**–**
Flush square	**F0SC**	**F5SC**	**F0SC**	**F5SC**
Extended round	**E0RC**	**E5RC**	**–**	**–**
Flush round	**–**	**–**	**F0RC**	**F5RC**

Contact arrangement and terminal

Contact arrangement	Code	Type of terminal
SPDT	**C1**	Tab (#110) and solder dual-use terminal
2PDT	**C2**	

Color of button

Color	Code
Green	**G**
Red	**R**
Black *1	**B**
White *2	**W**
Yellow	**Y**
Orange	**A**
Blue	**S**

Notes: The button is transparent in color.
*1: A combination of the transparent button and the black legend plate comes to black.
*2: A combination of the transparent button and the white legend plate comes to white.

Note: The manufacturing range varies depending on the model. For details, see “Types and dimensions” of this catalog.

• Pilot lights

DR16 D0LC – E3 W

Product category

Category	Degree of protection	Code
Standard type	IP40	**DR15**
	IP65	**DR16**
Thin type	IP40	**DF15**
	IP65	**DF16**

Lens shape

Lens shape	Code	
	Standard type	Thin type
Flush rectangular	**F0NC**	**F0NC**
Flush square	**F0MC**	**F0MC**
Extended round	**E0LC**	**–**
Flush round	**–**	**F0LC**
Dome	**D0LC**	**–**

Color of lens

Color	LED color	Code
Green	Green	**G**
Red	Red	**R**
White *1	White	**W**
Yellow	White	**Y**
Orange	Amber	**A**
Blue	Blue	**S**

Note: The lens is transparent in color.
*1 : A combination of the transparent lens and the white legend plate comes to white (except for dome type).

Lamp operational voltage and light source

Applied method	Voltage	Code
		LED
Without transformer	12V DC	**B3**
	24V DC	**E3**

Note: The terminal used is a tab (#110) and solder dual-use terminal.

Note: The manufacturing range varies depending on the model. For details, see “Types and dimensions” of this catalog.

Type number nomenclature

• Selector switches (Knob type)

AR16 PTC – 2 C1 B

Product category

Category	Degree of protection	Code
Standard type	IP40	**AR15**
	IP65	**AR16**
Thin type	IP40	**AF15**
	IP65	**AF16**

Operator shape

Operator shape	Code
Knob with rectangular bezel	**PTC**
Knob with square bezel	**PSC**
Knob with round bezel	**PRC**

Color of knob

Color	Code
Black	**B**

Contact arrangement and terminal

Contact arrangement	Code	Type of terminal
SPDT *1	**C1**	Tab (#110) and solder dual-use terminal
2PDT	**C2**	

Note: *1 2-position model only available

No. of positions and operator action

No. of positions	Operator action	Code
2-position (90°)	Maintained	**2**
	Spring return (Right to left)	**0**
3-position (45°)	Maintained	**3**
	Spring/manual return (Left to center)	**6**
	Spring/manual return (Right to center)	**7**
	Spring return (Left or right to center)	**1**

• Selector switches (Key type)

AR16 JTC – 3 E C2 A

Product category

Category	Degree of protection	Code
Standard type	IP40	**AR15**
	IP65	**AR16**
Thin type	IP40	**AF15**
	IP65	**AF16**

Operator shape

Operator shape	Code
Key with rectangular bezel	**JTC**
Key with square bezel	**JSC**
Key with round bezel	**JRC**

No. of positions and operator action

No. of positions	Operator action	Code
2-position (90°)	Maintained	**2**
	Spring return (Right to left)	**0**
3-position (45°)	Maintained	**3**
	Spring/manual return (Left to center)	**6**
	Spring/manual return (Right to center)	**7**
	Spring return (Left or right to center)	**1**

Types of key

Type *1	A	B	C	D	E	F
Code	**A**	**B**	**C**	**D**	**E**	**F**

Note: *1 "A" is standard.

Contact arrangement and terminal

Contact arrangement	Code	Type of terminal
SPDT *2	**C1**	Tab (#110) and solder dual-use terminal
2PDT	**C2**	

Note: *2 2-position model only

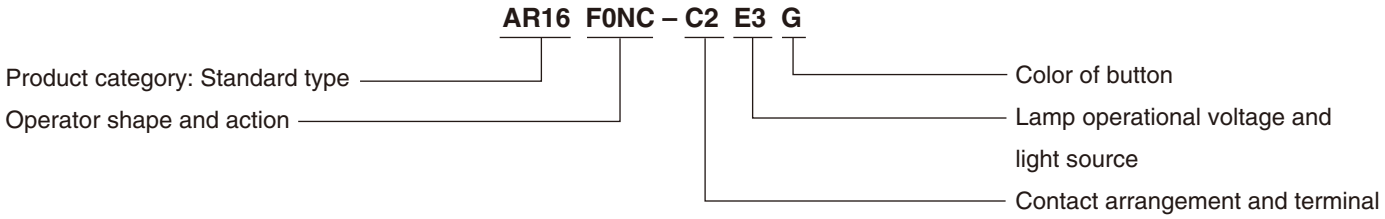
Key removable position

Key removable position	Applicable operator action 2	0	3	6	7	1	Code
Left	○	○	○	–	○	–	**A**
Left and right	○	–	○	–	–	–	**B**
Left, center and right	–	–	○	–	–	–	**C**
Right	○	–	○	○	–	–	**D**
Center	–	–	○	○	○	○	**E**
Center and right	–	–	○	○	–	–	**F**
Left and center	–	–	○	–	○	–	**G**

1. Standard type, AR15C•DR15C and AR16C•DR16C

■ Illuminated pushbutton switches (LED illuminated)

• Type number system



• Type

Operator and Appearance (Standard type)	Lamp operational voltage	Conntact arrangement	Momentary action Type		Alternate action Type	
			IP40	IP65	IP40	IP65
Flush rectangular 	12V DC	SPDT	**AR15F0NC-C1B3□**	**AR16F0NC-C1B3□**	**AR15F5NC-C1B3□**	**AR16F5NC-C1B3□**
		2PDT	**AR15F0NC-C2B3□**	**AR16F0NC-C2B3□**	**AR15F5NC-C2B3□**	**AR16F5NC-C2B3□**
	24V DC	SPDT	**AR15F0NC-C1E3□**	**AR16F0NC-C1E3□**	**AR15F5NC-C1E3□**	**AR16F5NC-C1E3□**
		2PDT	**AR15F0NC-C2E3□**	**AR16F0NC-C2E3□**	**AR15F5NC-C2E3□**	**AR16F5NC-C2E3□**
Flush rectangular with guard 	12V DC	SPDT	**AR15G0NC-C1B3□**	**AR16G0NC-C1B3□**	**AR15G5NC-C1B3□**	**AR16G5NC-C1B3□**
		2PDT	**AR15G0NC-C2B3□**	**AR16G0NC-C2B3□**	**AR15G5NC-C2B3□**	**AR16G5NC-C2B3□**
	24V DC	SPDT	**AR15G0NC-C1E3□**	**AR16G0NC-C1E3□**	**AR15G5NC-C1E3□**	**AR16G5NC-C1E3□**
		2PDT	**AR15G0NC-C2E3□**	**AR16G0NC-C2E3□**	**AR15G5NC-C2E3□**	**AR16G5NC-C2E3□**
Flush square 	12V DC	SPDT	**AR15F0MC-C1B3□**	**AR16F0MC-C1B3□**	**AR15F5MC-C1B3□**	**AR16F5MC-C1B3□**
		2PDT	**AR15F0MC-C2B3□**	**AR16F0MC-C2B3□**	**AR15F5MC-C2B3□**	**AR16F5MC-C2B3□**
	24V DC	SPDT	**AR15F0MC-C1E3□**	**AR16F0MC-C1E3□**	**AR15F5MC-C1E3□**	**AR16F5MC-C1E3□**
		2PDT	**AR15F0MC-C2E3□**	**AR16F0MC-C2E3□**	**AR15F5MC-C2E3□**	**AR16F5MC-C2E3□**
Extended round 	12V DC	SPDT	**AR15E0LC-C1B3□**	**AR16E0LC-C1B3□**	**AR15E5LC-C1B3□**	**AR16E5LC-C1B3□**
		2PDT	**AR15E0LC-C2B3□**	**AR16E0LC-C2B3□**	**AR15E5LC-C2B3□**	**AR16E5LC-C2B3□**
	24V DC	SPDT	**AR15E0LC-C1E3□**	**AR16E0LC-C1E3□**	**AR15E5LC-C1E3□**	**AR16E5LC-C1E3□**
		2PDT	**AR15E0LC-C2E3□**	**AR16E0LC-C2E3□**	**AR15E5LC-C2E3□**	**AR16E5LC-C2E3□**

Note:See page 21 for the outline dimensions.

• Button color

Replace the □ mark by the color code

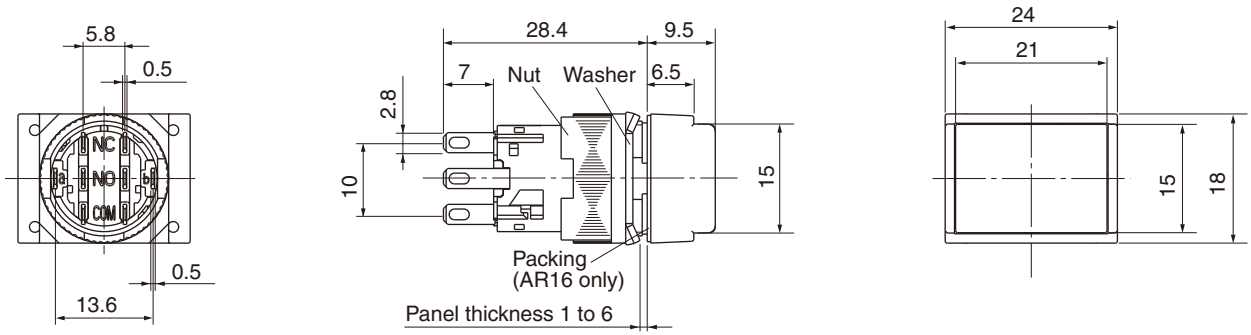
Color	Green	Red	White	Yellow	Orange	Blue
Code	G	R	W *1	Y	A	S

Note: *1 A combination of the transparent button and the white legend plate comes to white.

• Dimensions, mm

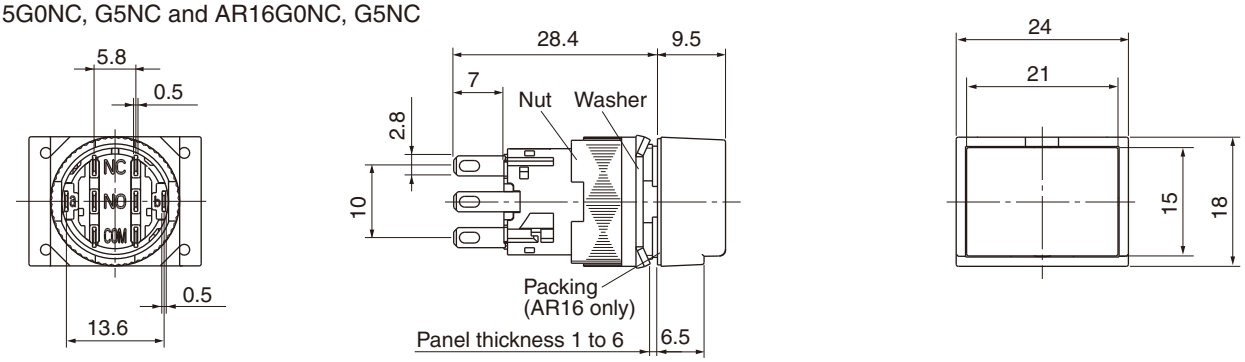
Flush rectangular

AR15F0NC, F5NC and AR16F0NC, F5NC



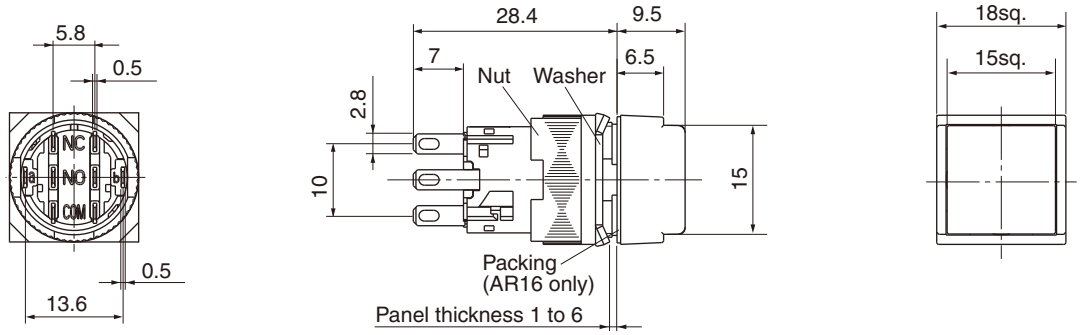
Flush rectangular with guard

AR15G0NC, G5NC and AR16G0NC, G5NC



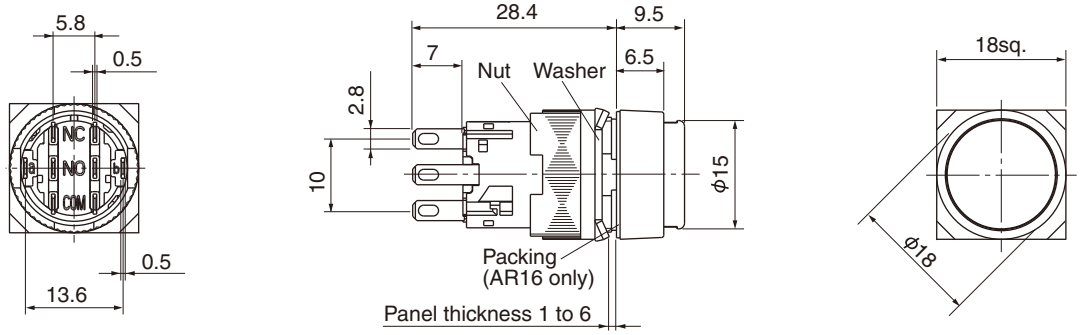
Flush square

AR15F0MC, F5MC and AR16F0MC, F5MC



Extended round

AR15E0LC, E5LC and AR16E0LC, E5LC



■ Pushbutton switches

• Type number system

AR16 F0TC – C2 G

- AR16 F0TC: Product category: Standard type; Operator shape and action
- C2: Contact arrangement and terminal
- G: Color of button

• Type

Operator and Appearance (Standard type)	Conntact arrangement	Momentary action Type		Alternate action Type	
		IP40	IP65	IP40	IP65
Flush rectangular 	SPDT	**AR15F0TC-C1□**	**AR16F0TC-C1□**	**AR15F5TC-C1□**	**AR16F5TC-C1□**
	2PDT	**AR15F0TC-C2□**	**AR16F0TC-C2□**	**AR15F5TC-C2□**	**AR16F5TC-C2□**
Flush rectangular with guard 	SPDT	**AR15G0TC-C1□**	**AR16G0TC-C1□**	**AR15G5TC-C1□**	**AR16G5TC-C1□**
	2PDT	**AR15G0TC-C2□**	**AR16G0TC-C2□**	**AR15G5TC-C2□**	**AR16G5TC-C2□**
Flush square 	SPDT	**AR15F0SC-C1□**	**AR16F0SC-C1□**	**AR15F5SC-C1□**	**AR16F5SC-C1□**
	2PDT	**AR15F0SC-C2□**	**AR16F0SC-C2□**	**AR15F5SC-C2□**	**AR16F5SC-C2□**
Extended round 	SPDT	**AR15E0RC-C1□**	**AR16E0RC-C1□**	**AR15E5RC-C1□**	**AR16E5RC-C1□**
	2PDT	**AR15E0RC-C2□**	**AR16E0RC-C2□**	**AR15E5RC-C2□**	**AR16E5RC-C2□**

Note: See page 23 for the outline dimensions.

• Button color

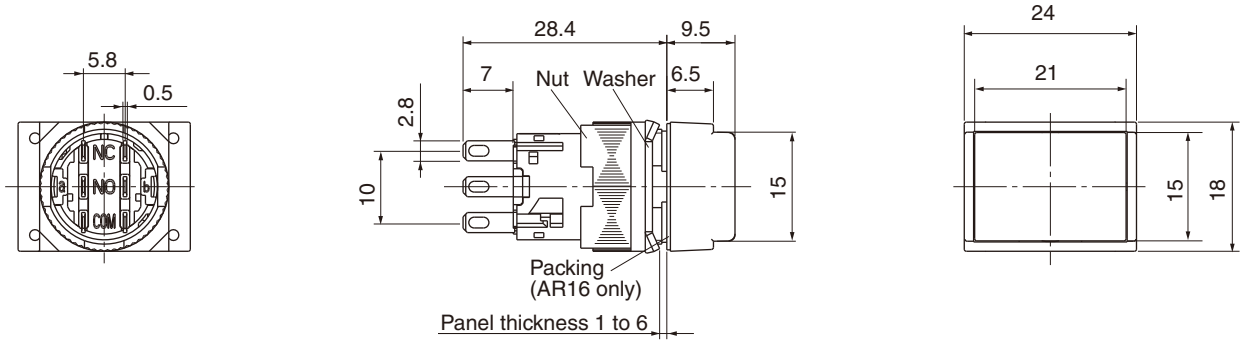
Replace the □ mark by the color code

Color	Green	Red	Black	White	Yellow	Orange	Blue
Code	G	R	B *1	W *2	Y	A	S

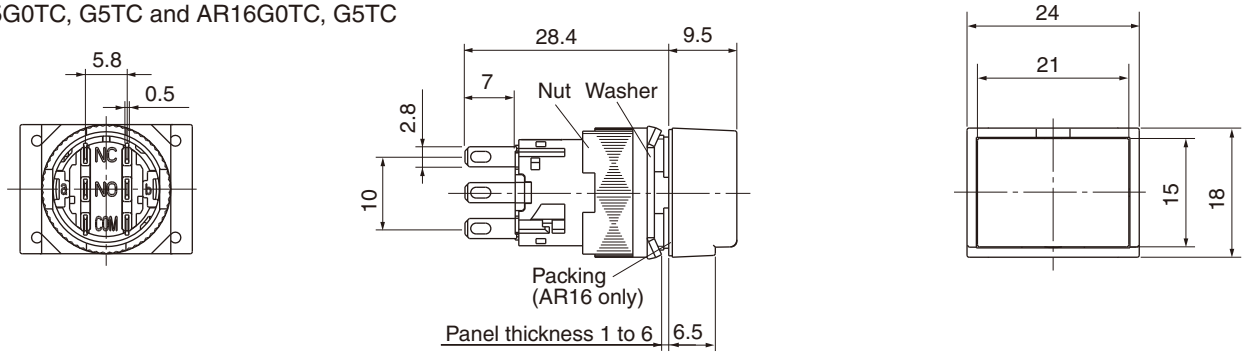
Notes: *1 A combination of the transparent button and the black legend plate comes to black.
*2 A combination of the transparent button and the white legend plate comes to white.

• Dimensions, mm

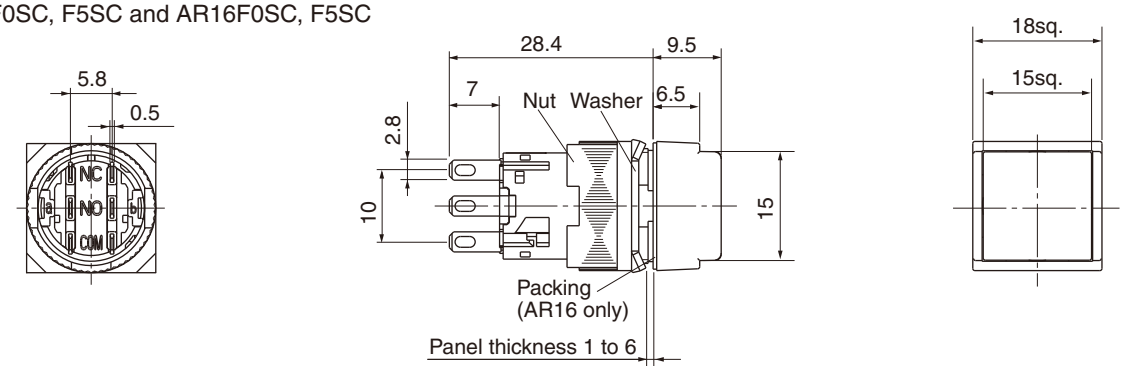
Flush rectangular
AR15F0TC, F5TC and AR16F0TC, F5TC



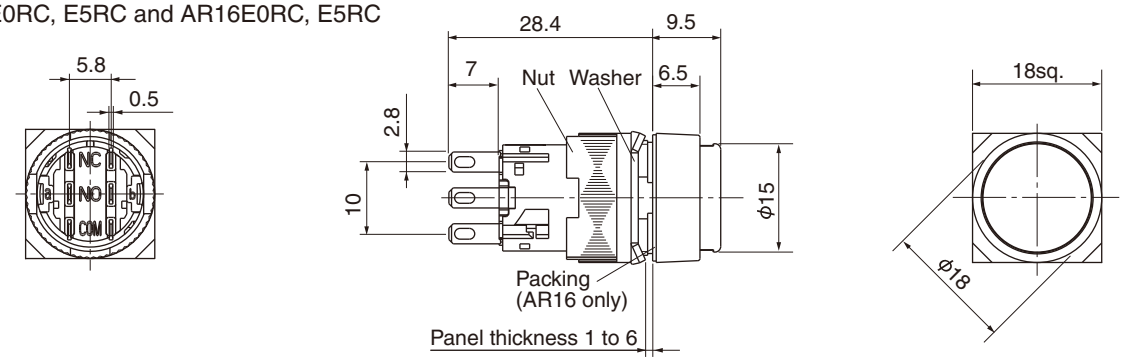
Flush rectangular with guard
AR15G0TC, G5TC and AR16G0TC, G5TC



Flush square
AR15F0SC, F5SC and AR16F0SC, F5SC



Extended round
AR15E0RC, E5RC and AR16E0RC, E5RC



■ Pilot lights (LED illuminated)

• Type number system

DR16 D0LC – E3 W

- DR16: Product category: Standard type
- D0LC: Lens shape
- E3: Lamp operational voltage and light source
- W: Color of lens

• Type

Lens and Appearance (Standard type)	LED lamp operational voltage	Type	
		IP40	IP65
Flush rectangular 	12V DC	**DR15F0NC-B3□**	**DR16F0NC-B3□**
	24V DC	**DR15F0NC-E3□**	**DR16F0NC-E3□**
Flush square 	12V DC	**DR15F0MC-B3□**	**DR16F0MC-B3□**
	24V DC	**DR15F0MC-E3□**	**DR16F0MC-E3□**
Extended round 	12V DC	**DR15E0LC-B3□**	**DR16E0LC-B3□**
	24V DC	**DR15E0LC-E3□**	**DR16E0LC-E3□**
Dome 	12V DC	**DR15D0LC-B3□**	**DR16D0LC-B3□**
	24V DC	**DR15D0LC-E3□**	**DR16D0LC-E3□**

Note: See page 25 for the outline dimensions.

• Lens color

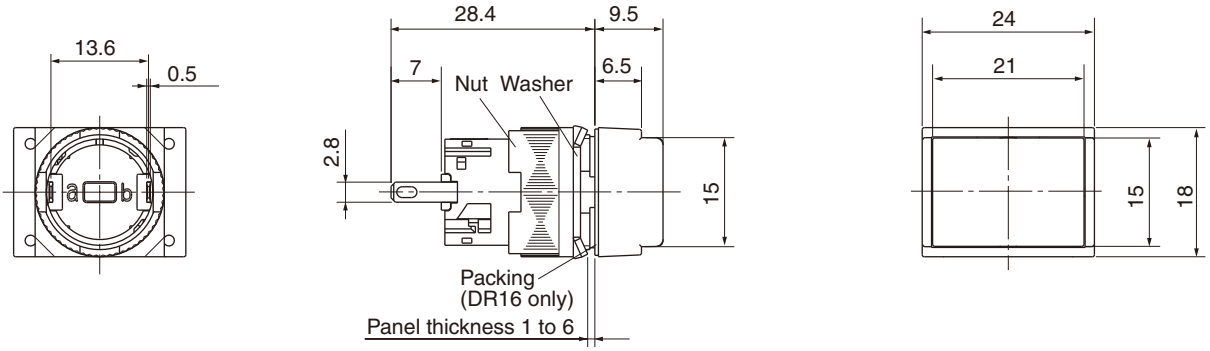
Replace the □ mark by the color code

Color	Green	Red	White	Yellow	Orange	Blue
Code	G	R	W *1	Y	A	S

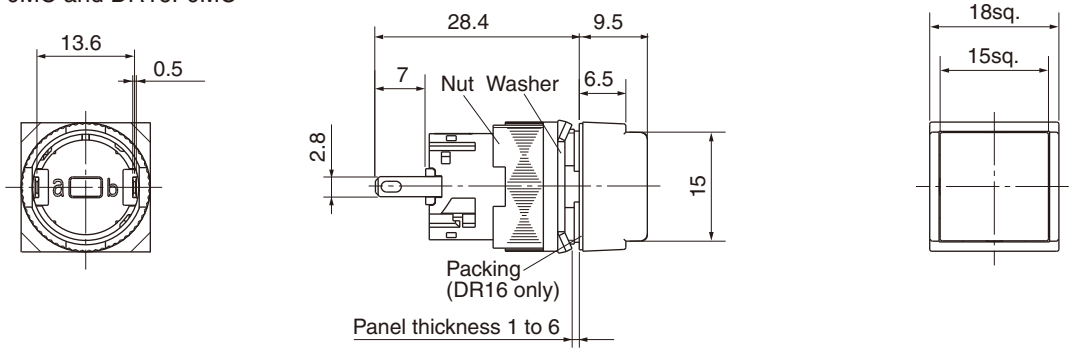
Note: *1 A combination of the transparent lens and the white legend plate comes to white (except for dome type).

• **Dimensions, mm**

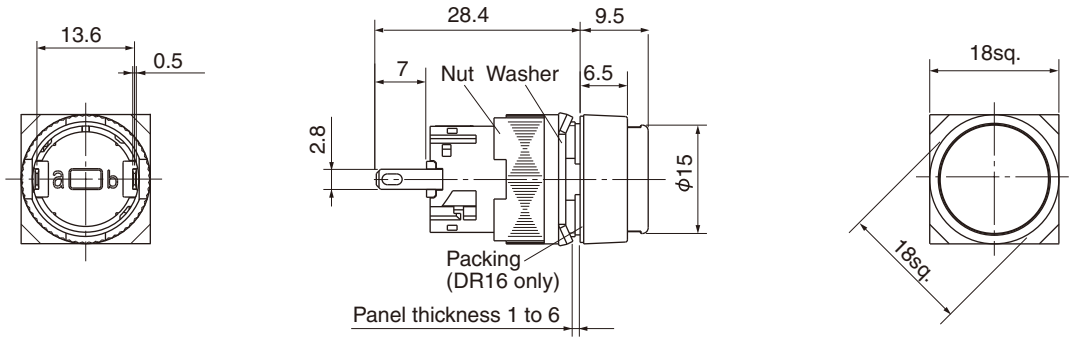
Flush rectangular
DR15F0NC and DR16F0NC



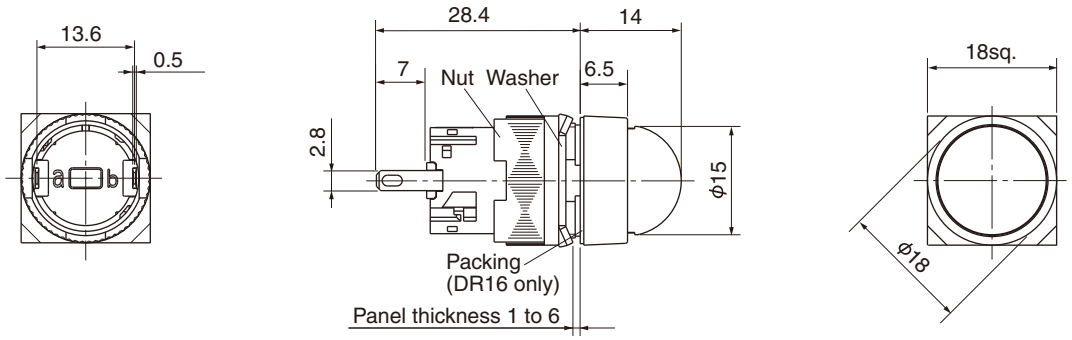
Flush square
DR15F0MC and DR16F0MC



Extended round
DR15E0LC and DR16E0LC



Dome
DR15D0LC and DR16D0LC



■ Selector switches (Knob type)

• Type number system

AR16 PTC – 2 C2 B

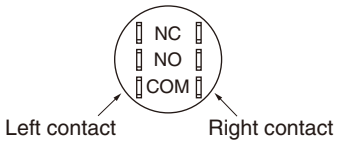
- Product category: Standard type
- Operator shape
- No. of positions and operator action
- Contact arrangement and terminal
- Color of knob: Black

• Type

2-position

Operator and appearance (Standard type)	Contact arrangement	Type				Contact operation			
		1 2 Maintained/90°		1 2 Spring return/90°		Contact unit *1		Operator position *2	
		IP40	IP65	IP40	IP65			1	2
Knob with rectangular bezel **AR15PTC,AR16PTC** 	SPDT	**AR15PTC-2C1B** **AR15PSC-2C1B** **AR15PRC-2C1B**	**AR16PTC-2C1B** **AR16PSC-2C1B** **AR16PRC-2C1B**	**AR15PTC-0C1B** **AR15PSC-0C1B** **AR15PRC-0C1B**	**AR16PTC-0C1B** **AR16PSC-0C1B** **AR16PRC-0C1B**	Left	COM – NC / NO	●	●
Knob with square bezel **AR15PSC,AR16PSC** 	2PDT	**AR15PTC-2C2B** **AR15PSC-2C2B** **AR15PRC-2C2B**	**AR16PTC-2C2B** **AR16PSC-2C2B** **AR16PRC-2C2B**	**AR15PTC-0C2B** **AR15PSC-0C2B** **AR15PRC-0C2B**	**AR16PTC-0C2B** **AR16PSC-0C2B** **AR16PRC-0C2B**	Left	COM – NC / NO	●	●
Knob with round bezel **AR15PRC,AR16PRC** 						Right	COM – NC / NO	●	●

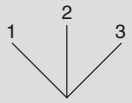
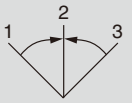
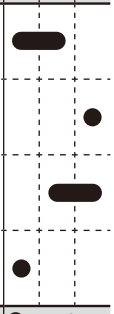
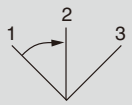
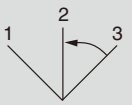
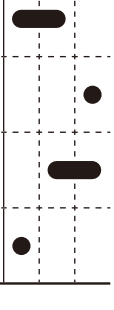
Note: *1 Terminal arrangement of contact (View from the terminal side (the back)).



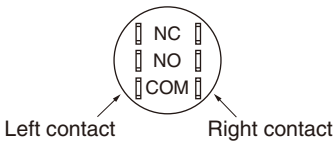
*2 ●: Means the contact closed (ON).

• See page 28 for the outline dimensions.

3-position

Operator and appearance (Standard type)	Contact arrangement	Type				Contact operation		
		 Maintained/each 45°		 Spring return/each 45°		Contact unit *1		Operator position *2
		IP40	IP65	IP40	IP65			1 2 3
Knob with rectangular bezel **AR15PTC,AR16PTC** 	2PDT	**AR15PTC-3C2B** **AR15PSC-3C2B** **AR15PRC-3C2B**	**AR16PTC-3C2B** **AR16PSC-3C2B** **AR16PRC-3C2B**	**AR15PTC-1C2B** **AR15PSC-1C2B** **AR15PRC-1C2B**	**AR16PTC-1C2B** **AR16PSC-1C2B** **AR16PRC-1C2B**	Left Right	COM NC NO COM NC NO	
Knob with square bezel **AR15PSC,AR16PSC** 		 Spring/manual return/each 45°		 Spring/manual return/each 45°		Contact unit *1		Operator position *2
		IP40	IP65	IP40	IP65			1 2 3
Knob with round bezel **AR15PRC,AR16PRC** 		**AR15PTC-6C2B** **AR15PSC-6C2B** **AR15PRC-6C2B**	**AR16PTC-6C2B** **AR16PSC-6C2B** **AR16PRC-6C2B**	**AR15PTC-7C2B** **AR15PSC-7C2B** **AR15PRC-7C2B**	**AR16PTC-7C2B** **AR16PSC-7C2B** **AR16PRC-7C2B**	Left Right	COM NC NO COM NC NO	

Notes: *1 Terminal arrangement of contact (View from the terminal side (the back)).

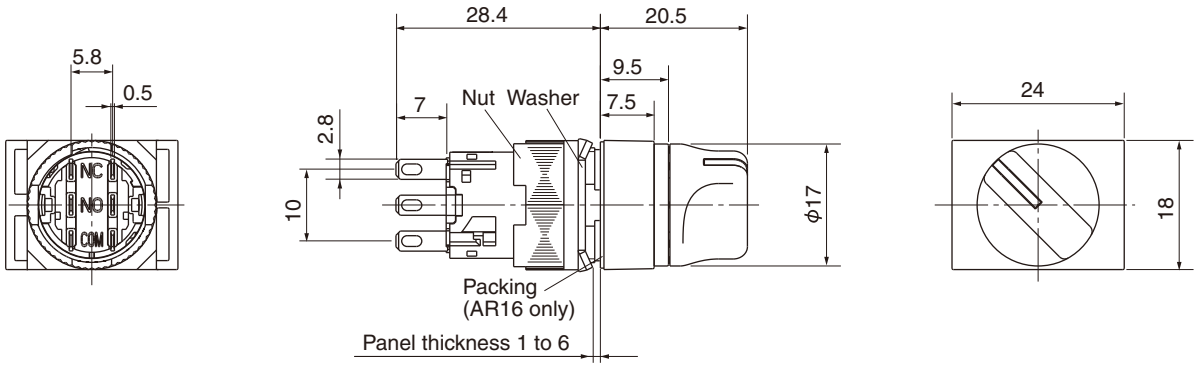


*2 ●, ▬ : means the contact closed (ON).

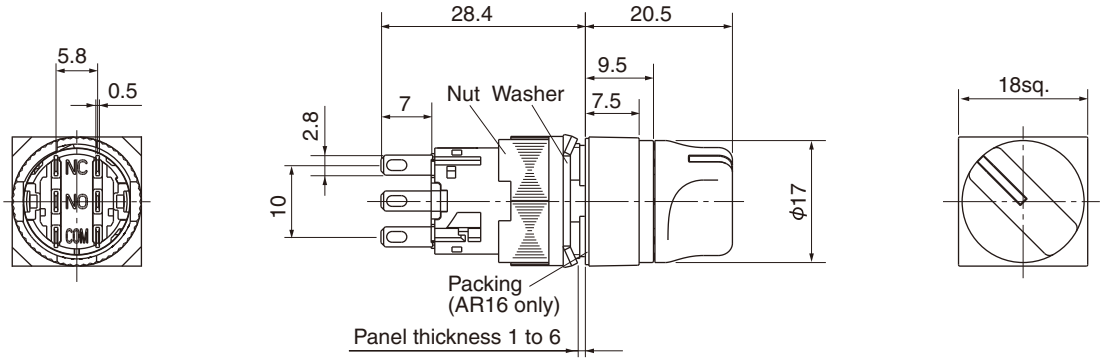
• See page 28 for the outline dimensions.

• Dimensions, mm

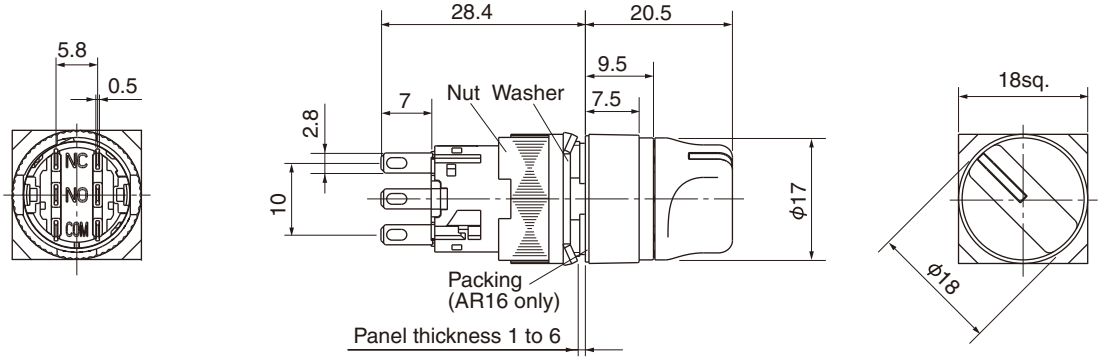
Knob with rectangular bezel
AR15PTC and AR16PTC



Knob with square bezel
AR15PSC and AR16PSC



Knob with round bezel
AR15PRC and AR16PRC



■ Selector switches (Key type)

• Type number system

AR16 JTC – 2 B C2 A

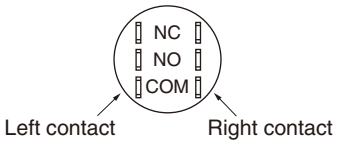
- Product category: Standard type
- Operator shape
- No. of positions and operator action
- Key removable position
- Contact arrangement and terminal
- Type of key

• Type

2-position

Operator and appearance (Standard type)	Contact arrangement	Type				Contact operation			
		1 2 Maintained/90°		1 2 Spring return/90°		Contact unit *1		Operator position *2	
		IP40	IP65	IP40	IP65			1	2
Key with rectangular bezel **AR15JTC,AR16JTC** 	SPDT	**AR15JTC-2■C1A** **AR15JSC-2■C1A** **AR15JRC-2■C1A**	**AR16JTC-2■C1A** **AR16JSC-2■C1A** **AR16JRC-2■C1A**	**AR15JTC-0AC1A** **AR15JSC-0AC1A** **AR15JRC-0AC1A**	**AR16JTC-0AC1A** **AR16JSC-0AC1A** **AR16JRC-0AC1A**	Left	COM – NC / NO	●	●
Key with square bezel **AR15JSC,AR16JSC** 	2PDT	**AR15JTC-2■C2A** **AR15JSC-2■C2A** **AR15JRC-2■C2A**	**AR16JTC-2■C2A** **AR16JSC-2■C2A** **AR16JRC-2■C2A**	**AR15JTC-0AC2A** **AR15JSC-0AC2A** **AR15JRC-0AC2A**	**AR16JTC-0AC2A** **AR16JSC-0AC2A** **AR16JRC-0AC2A**	Left	COM – NC / NO	●	●
Key with round bezel **AR15JRC,AR16JRC** 						Right	COM – NC / NO	●	●

Notes: *1 Terminal arrangement of contact (View from the terminal side (the back)).



*2 ●: Means the contact closed (ON).

• See page 31 for the outline dimensions.

• Key removable position

Specify the key removal position in the square ■ mark.

Key removable position	Applied operator action		Code
	2	0	
Left ⊘	○	○	**A**
Left•Right ⊗	○	–	**B**
Left ⊘	○	–	**D**

○: Available –: Not available

• Type of key

Type *1	A	B	C	D	E	F
Code	**A**	**B**	**C**	**D**	**E**	**F**

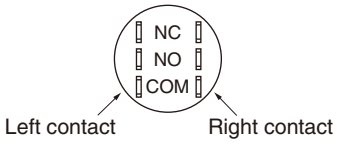
*1 "A" is standard.

AR15C • DR15C, AR16C • DR16C
Type numbers and dimensions

3-position

Operator and appearance (Standard type)	Contact arrangement	Type				Contact operation	
		Maintained/each 45°		Spring return/each 45°		Contact unit *1	Operator position *2
		IP40	IP65	IP40	IP65		1 2 3
Key with rectangular bezel **AR15JTC,AR16JTC** 	2PDT	**AR15JTC-3■C2A**	**AR16JTC-3■C2A**	**AR15JTC-1EC2A**	**AR16JTC-1EC2A**	Left COM NC NO	
		AR15JSC-3■C2A	**AR16JSC-3■C2A**	**AR15JSC-1EC2A**	**AR16JSC-1EC2A**		
		AR15JRC-3■C2A	**AR16JRC-3■C2A**	**AR15JRC-1EC2A**	**AR16JRC-1EC2A**	Right COM NC NO	
Key with square bezel **AR15JSC,AR16JSC** 		Spring/manual return/each 45°		Spring/manual return/each 45°		Contact unit *1	Operator position *2
		IP40	IP65	IP40	IP65		1 2 3
Key with round bezel **AR15JRC,AR16JRC** 		**AR15JTC-6■C2A**	**AR16JTC-6■C2A**	**AR15JTC-7■C2A**	**AR16JTC-7■C2A**	Left COM NC NO	
		AR15JSC-6■C2A	**AR16JSC-6■C2A**	**AR15JSC-7■C2A**	**AR16JSC-7■C2A**		
		AR15JRC-6■C2A	**AR16JRC-6■C2A**	**AR15JRC-7■C2A**	**AR16JRC-7■C2A**	Right COM NC NO	

Notes: *1 Terminal arrangement of contact (View form the terminal side (the back)).



*2 ●, ▬ : Means the contact closed (ON).

• See page 31 for the outline dimensions.

• Key removal position

Specify the key removal position in the square ■ mark.

Key removable position	Applied operator action				Code
	3	6	7	1	
Left	○	–	○	–	**A**
Left•Right	○	–	–	–	**B**
Left•Center•Right	○	–	–	–	**C**
Right	○	○	–	–	**D**
Center	○	○	○	○	**E**
Center•Right	○	○	–	–	**F**
Left•Center	○	–	○	–	**G**

○: Available –: Not available

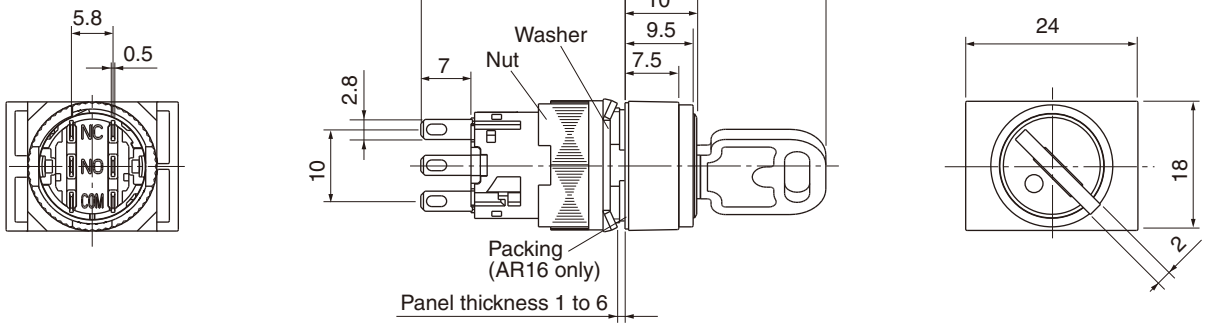
• Type of key

Type *1	A	B	C	D	E	F
Code	**A**	**B**	**C**	**D**	**E**	**F**

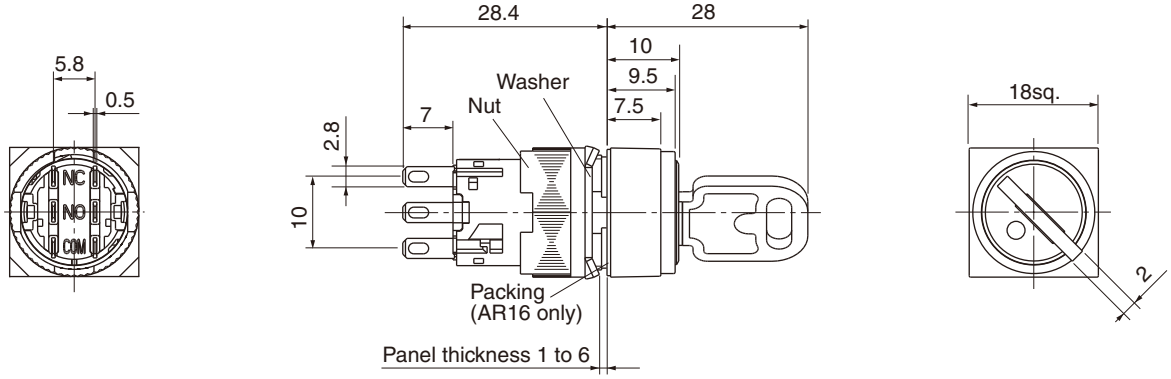
*1 "A" is standard.

• **Dimensions, mm**

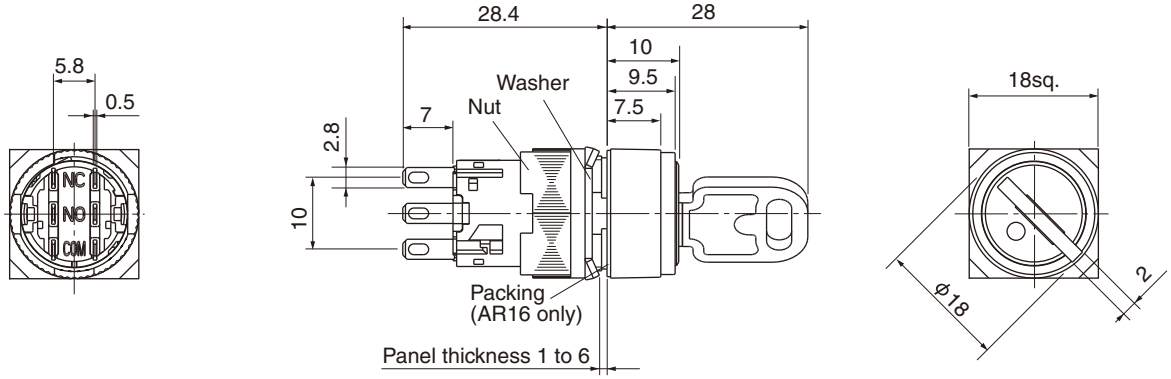
Key with rectangular bezel
AR15JTC and AR16JTC



Key with square bezel
AR15JSC and AR16JSC



Key with round bezel
AR15JRC and AR16JRC



2. Thin type, AF15C•DF15C and AF16C•DF16C

■ Illuminated pushbutton switches (LED illuminated)

• Type number system

AF16 F0NC – C2 E3 G

- Prodect category: Thin type
- Operator shape and action
- Color of button
- Lamp operational voltage and light source
- Contact arrangement and terminal

• Type

Operator and Appearance (Thin type)	LED lamp operational voltage	Conntact arrangement	Momentary action Type		Alternate action Type	
			IP40	IP65	IP40	IP65
Flush rectangular 	12V DC	SPDT	**AF15F0NC-C1B3□**	**AF16F0NC-C1B3□**	**AF15F5NC-C1B3□**	**AF16F5NC-C1B3□**
		2PDT	**AF15F0NC-C2B3□**	**AF16F0NC-C2B3□**	**AF15F5NC-C2B3□**	**AF16F5NC-C2B3□**
	24V DC	SPDT	**AF15F0NC-C1E3□**	**AF16F0NC-C1E3□**	**AF15F5NC-C1E3□**	**AF16F5NC-C1E3□**
		2PDT	**AF15F0NC-C2E3□**	**AF16F0NC-C2E3□**	**AF15F5NC-C2E3□**	**AF16F5NC-C2E3□**
Flush square 	12V DC	SPDT	**AF15F0MC-C1B3□**	**AF16F0MC-C1B3□**	**AF15F5MC-C1B3□**	**AF16F5MC-C1B3□**
		2PDT	**AF15F0MC-C2B3□**	**AF16F0MC-C2B3□**	**AF15F5MC-C2B3□**	**AF16F5MC-C2B3□**
	24V DC	SPDT	**AF15F0MC-C1E3□**	**AF16F0MC-C1E3□**	**AF15F5MC-C1E3□**	**AF16F5MC-C1E3□**
		2PDT	**AF15F0MC-C2E3□**	**AF16F0MC-C2E3□**	**AF15F5MC-C2E3□**	**AF16F5MC-C2E3□**
Flush round 	12V DC	SPDT	**AF15F0LC-C1B3□**	**AF16F0LC-C1B3□**	**AF15F5LC-C1B3□**	**AF16F5LC-C1B3□**
		2PDT	**AF15F0LC-C2B3□**	**AF16F0LC-C2B3□**	**AF15F5LC-C2B3□**	**AF16F5LC-C2B3□**
	24V DC	SPDT	**AF15F0LC-C1E3□**	**AF16F0LC-C1E3□**	**AF15F5LC-C1E3□**	**AF16F5LC-C1E3□**
		2PDT	**AF15F0LC-C2E3□**	**AF16F0LC-C2E3□**	**AF15F5LC-C2E3□**	**AF16F5LC-C2E3□**

Note: • The panel cutting dimensions differ depending on the operator shape of thin type model. See page 44.
• For the dimensions, see page 33.

•Button color

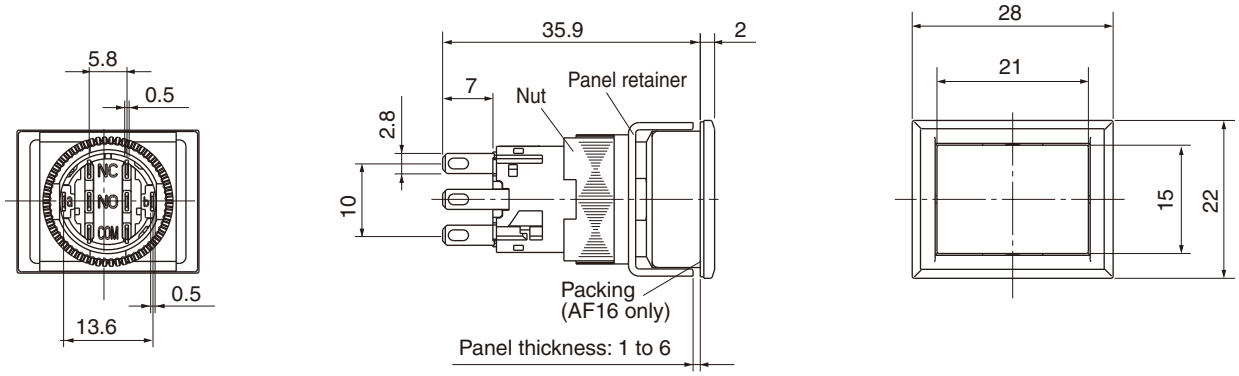
Replace the □ mark by the color code.

Color	Green	Red	White	Yellow	Orange	Blue
Code	G	R	W *1	Y	A	S

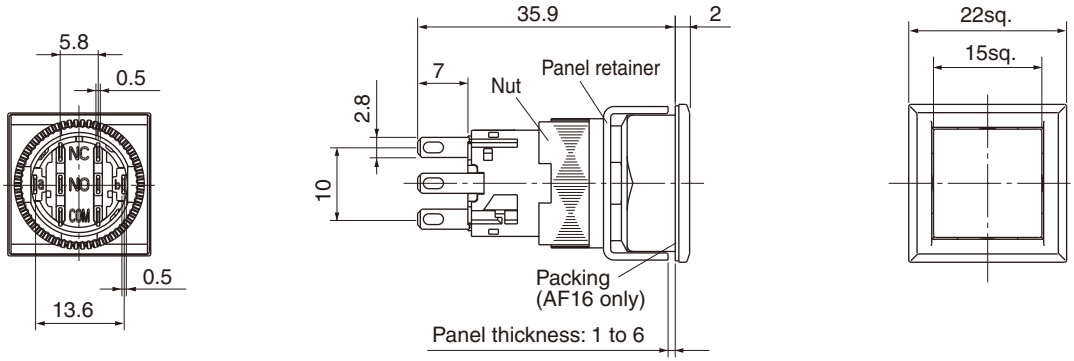
Note: *1 A combination of the translucent button and the white legend plate comes to white lens.

• Dimensions, mm

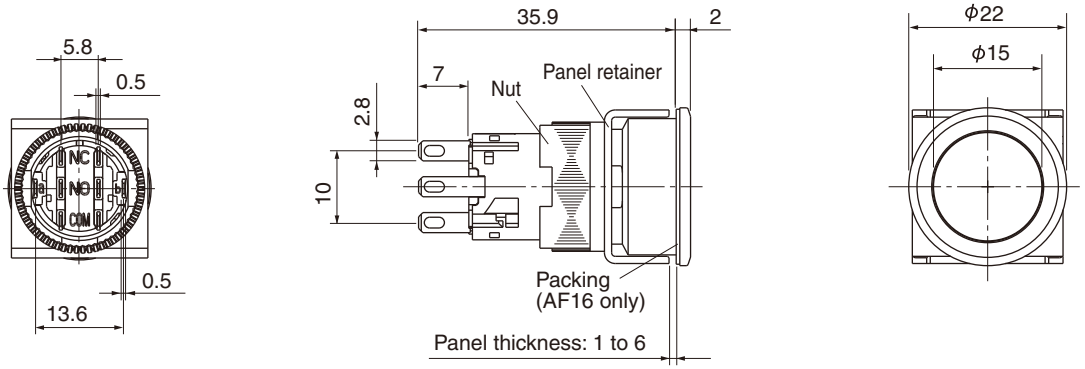
Flush rectangular
AF15F0NC, F5NC and AF16F0NC, F5NC



Flush square
AF15F0MC, F5MC and AF16F0MC, F5MC



Flush round
AF15F0LC, F5LC and AF16F0LC, F5LC



■ Pushbutton switches

• Type number system

AF16 F0TC – C2 G

- AF16 F0TC: Prodect category: Thin type; Operator shape and action
- C2: Contact arrangement and terminal
- G: Color of button

• Type

Operator and Appearance (Thin type)	Contact arrangement	Momentary action Type		Alternate action Type	
		IP40	IP65	IP40	IP65
Flush rectangular 	SPDT	**AF15F0TC-C1□**	**AF16F0TC-C1□**	**AF15F5TC-C1□**	**AF16F5TC-C1□**
	2PDT	**AF15F0TC-C2□**	**AF16F0TC-C2□**	**AF15F5TC-C2□**	**AF16F5TC-C2□**
Flush square 	SPDT	**AF15F0SC-C1□**	**AF16F0SC-C1□**	**AF15F5SC-C1□**	**AF16F5SC-C1□**
	2PDT	**AF15F0SC-C2□**	**AF16F0SC-C2□**	**AF15F5SC-C2□**	**AF16F5SC-C2□**
Flush round 	SPDT	**AF15F0RC-C1□**	**AF16F0RC-C1□**	**AF15F5RC-C1□**	**AF16F5RC-C1□**
	2PDT	**AF15F0RC-C2□**	**AF16F0RC-C2□**	**AF15F5RC-C2□**	**AF16F5RC-C2□**

Note: • The panel cutting dimensions differ depending on the operator shape of thin type model. See page 44.
• For the dimensions, see page 35.

• Button color

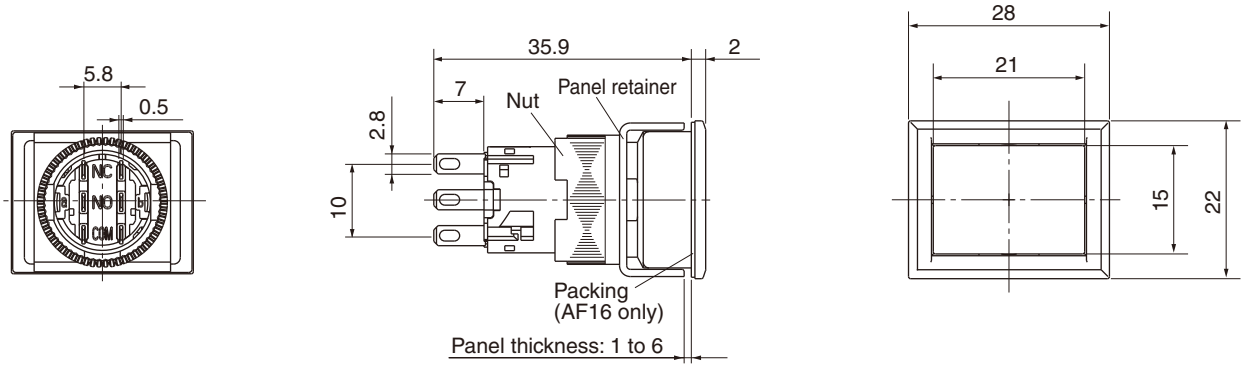
Replace the □ mark by the color code.

Color	Green	Black	Red	White	Yellow	Orange	Blue
Code	G	B *1	R	W *2	Y	A	S

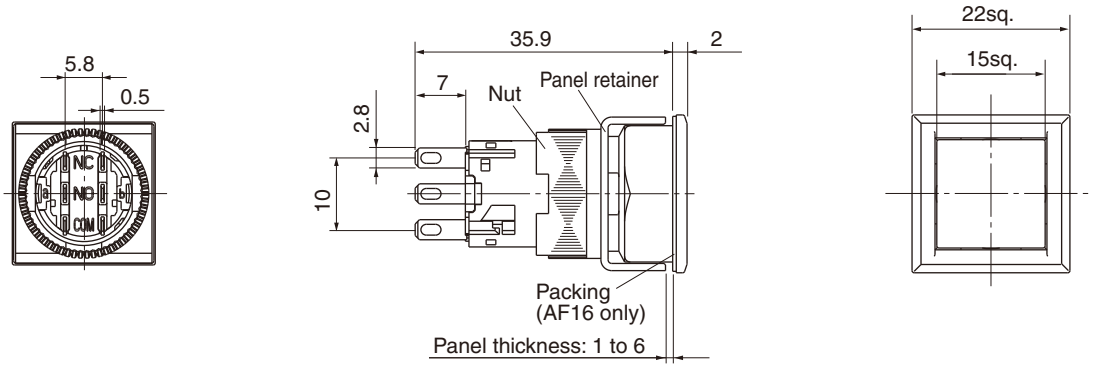
Notes: *1 A combination of the translucent button and the black legend plate comes to black.
*2 A combination of the translucent button and the white legend plate comes to white.

• Dimensions, mm

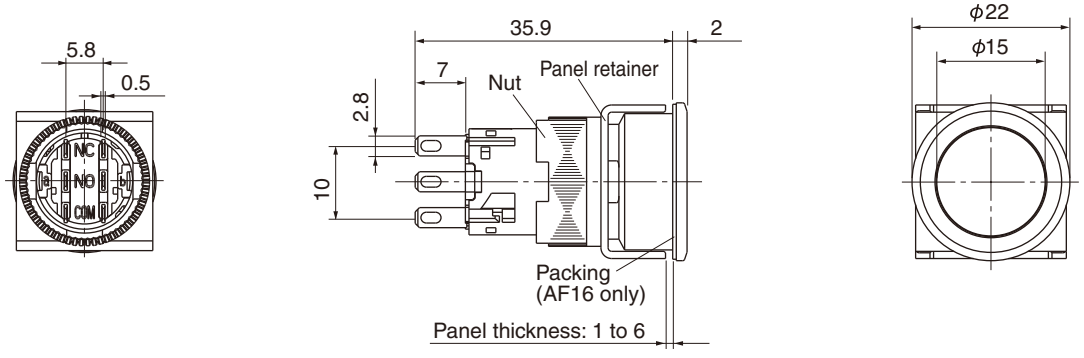
Flush rectangular
AF15F0TC, F5TC and AF16F0TC, F5TC



Flush square
AF15F0SC, F5SC and AF16F0SC, F5SC



Flush round
AF15F0RC, F5RC and AF16F0RC, F5RC



■ Pilot lights (LED illuminated)

• Type number system

DF16 F0NC – E3 W

- DF16: Product category: Thin type
- F0NC: Lens shape
- E3: Lamp operational voltage and light source
- W: Color of lens

• Type

Lens and Appearance (Thin type)	LED lamp operational voltage	Type	
		IP40	IP65
Flush rectangular 	12V DC	**DF15F0NC-B3□**	**DF16F0NC-B3□**
	24V DC	**DF15F0NC-E3□**	**DF16F0NC-E3□**
Flush square 	12V DC	**DF15F0MC-B3□**	**DF16F0MC-B3□**
	24V DC	**DF15F0MC-E3□**	**DF16F0MC-E3□**
Flush round 	12V DC	**DF15F0LC-B3□**	**DF16F0LC-B3□**
	24V DC	**DF15F0LC-E3□**	**DF16F0LC-E3□**

Note: • The panel cutting dimensions differ depending on the lens shape of thin type model. See page 44.
• For the dimensions, see page 37.

• Lens color

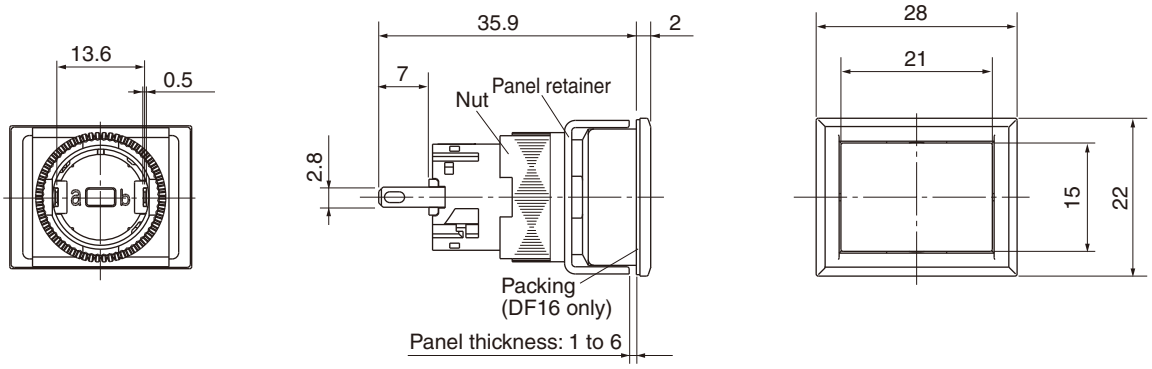
Replace the □ mark by the color code

Color	Green	Red	White	Yellow	Orange	Blue
Code	G	R	W *1	Y	A	S

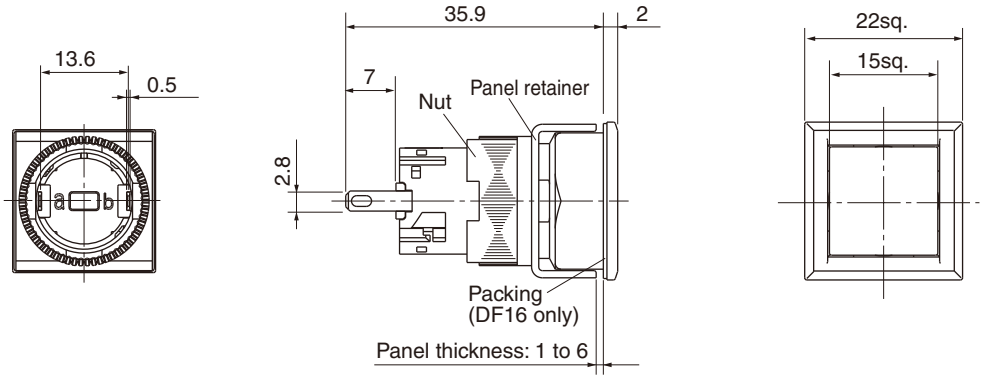
Note: *1 A combination of the transparent lens and the white legend plate comes to white.

• **Dimensions, mm**

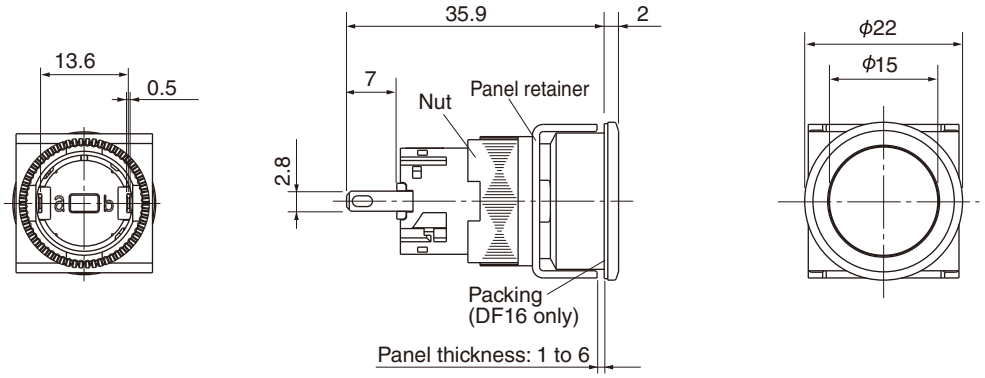
Flush rectangular
DF15F0NC and DF16F0NC



Flush square
DF15F0MC and DF16F0MC



Flush round
DF15F0LC and DF16F0LC



■ Selector switches (Knob type)

• Type number system

AF16 PTC – 2 C2 B

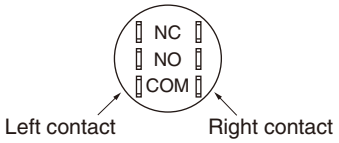
- AF16 PTC: Product category: Thin type / Operator shape
- 2: No. of positions and operator action
- C2: Contact arrangement and terminal
- B: Color of knob: Black

• Type

2-position

Operator (Thin type)	Conntact arrangement	Type				Contact operation			
		1 2 Maintained/90°		1 2 Spring return/90°		Contact unit *1		Operator position *2	
								1	2
		IP40	IP65	IP40	IP65				
Knob with rectangular bezel **AF15PTC,AF16PTC** 	SPDT	**AF15PTC-2C1B** **AF15PSC-2C1B** **AF15PRC-2C1B**	**AF16PTC-2C1B** **AF16PSC-2C1B** **AF16PRC-2C1B**	**AF15PTC-0C1B** **AF15PSC-0C1B** **AF15PRC-0C1B**	**AF16PTC-0C1B** **AF16PSC-0C1B** **AF16PRC-0C1B**	Left	COM NC NO	●	●
Knob with square bezel **AF15PSC,AF16PSC** 	2PDT	**AF15PTC-2C2B** **AF15PSC-2C2B** **AF15PRC-2C2B**	**AF16PTC-2C2B** **AF16PSC-2C2B** **AF16PRC-2C2B**	**AF15PTC-0C2B** **AF15PSC-0C2B** **AF15PRC-0C2B**	**AF16PTC-0C2B** **AF16PSC-0C2B** **AF16PRC-0C2B**	Left	COM NC NO	●	●
Knob with round bezel **AF15PRC,AF16PRC** 						Right	COM NC NO	●	●

Notes: *1 Terminal arrangement of contact (view from terminal side).

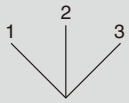
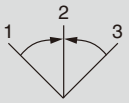
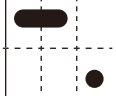
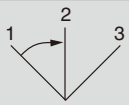
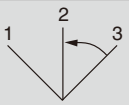
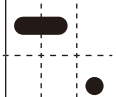


*2 ●: Contact closed.

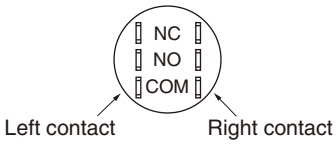
• The panel cutting dimensions differ depending on the operator shape of thin type model. See page 44.

• For the dimensions, see page 40.

3-position

Operator (Thin type)	Contact arrangement	Type				Contact operation			
		 Maintained/each 45°		 Spring return/each 45°		Contact unit *1			Operator position *2 1 2 3
		IP40	IP65	IP40	IP65				
Knob with flush square **AF15PTC,AF16PTC**  Knob with square bezel **AF15PSC,AF16PSC**  Knob with round bezel **AF15PRC,AF16PRC** 	2PDT	**AF15PTC-3C2B** **AF15PSC-3C2B** **AF15PRC-3C2B**	**AF16PTC-3C2B** **AF16PSC-3C2B** **AF16PRC-3C2B**	**AF15PTC-1C2B** **AF15PSC-1C2B** **AF15PRC-1C2B**	**AF16PTC-1C2B** **AF16PSC-1C2B** **AF16PRC-1C2B**	Left	COM	NC NO	
						Right	COM	NC NO	
		 Spring/manual return/each 45°		 Spring/manual return/each 45°		Contact unit *1			Operator position *2 1 2 3
		IP40	IP65	IP40	IP65				
		AF15PTC-6C2B **AF15PSC-6C2B** **AF15PRC-6C2B**	**AF16PTC-6C2B** **AF16PSC-6C2B** **AF16PRC-6C2B**	**AF15PTC-7C2B** **AF15PSC-7C2B** **AF15PRC-7C2B**	**AF16PTC-7C2B** **AF16PSC-7C2B** **AF16PRC-7C2B**	Left	COM	NC NO	
						Right	COM	NC NO	

Notes: *1 Terminal arrangement of contact (view from terminal side).

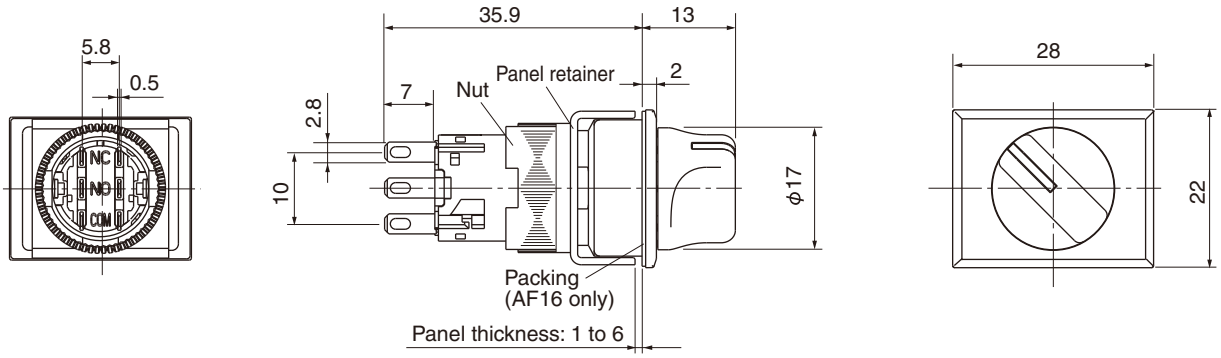


*2 ●, ▬ : Contact closed.

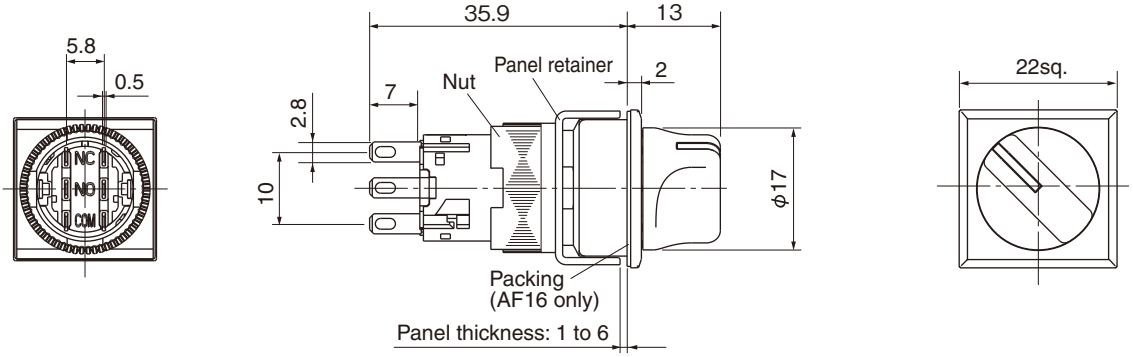
- The panel cutting dimensions differ depending on the operator shape of thin type model. See page 44.
- For the dimensions, see page 40.

• Dimensions, mm

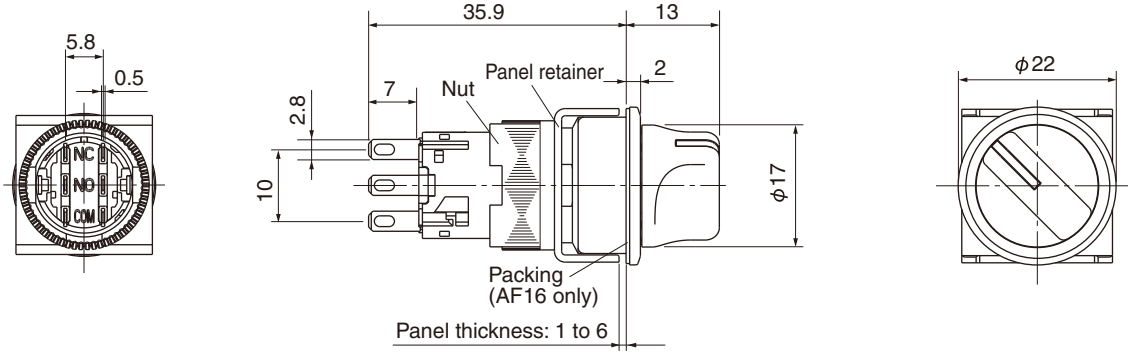
Knob with rectangular bezel
AF15PTC and AF16PTC



Knob with square bezel
AF15PSC and AF16PSC



Knob
AF15PRC and AF16PRC



■ Selector switches (Key type)

• Type number system

AF16 JTC – 2 B C2 A

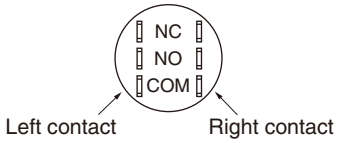
- Product category: Standard type
- Operator shape
- No. of positions and operator action
- Type of key
- Contact arrangement and terminal
- Key removable position

• Type

2-position

Operator (Thin type)	Contact arrangement	Type				Contact operation			
		1 2 Maintained/90°		1 2 Spring return/90°		Contact unit *1		Operator position *2	
		IP40	IP65	IP40	IP65			1	2
Key with rectangular bezel **AF15JTC,AF16JTC** 	SPDT	**AF15JTC-2■C1A**	**AF16JTC-2■C1A**	**AF15JTC-0AC1A**	**AF16JTC-0AC1A**	Left	COM NC NO	●	
		AF15JSC-2■C1A	**AF16JSC-2■C1A**	**AF15JSC-0AC1A**	**AF16JSC-0AC1A**				
		AF15JRC-2■C1A	**AF16JRC-2■C1A**	**AF15JRC-0AC1A**	**AF16JRC-0AC1A**				●
Key with square bezel **AF15JSC,AF16JSC** 	2PDT	**AF15JTC-2■C2A**	**AF16JTC-2■C2A**	**AF15JTC-0AC2A**	**AF16JTC-0AC2A**	Left	COM NC NO	●	
		AF15JSC-2■C2A	**AF16JSC-2■C2A**	**AF15JSC-0AC2A**	**AF16JSC-0AC2A**				
		AF15JRC-2■C2A	**AF16JRC-2■C2A**	**AF15JRC-0AC2A**	**AF16JRC-0AC2A**				●
Key with round bezel **AF15JRC,AF16JRC** 						Right	COM NC NO	●	
									●

Notes: *1 Terminal arrangement of contact (view from terminal side).



*2 ●: Contact closed.

• The panel cutting dimensions differ depending on the operator shape of thin type model. See page 44.
• For the dimensions, see page 43.

• Key removable position

Replace the ■ mark by the removable positiom code.

Removable position	Applied operatior position		Code
	2	0	
Left ⊘	○	○	**A**
Left•Right ⊗	○	–	**B**
Left ⊘	○	–	**C**

○: Available –: Not available

• Type of key

Type *1	A	B	C	D	E	F
Code	**A**	**B**	**C**	**D**	**E**	**F**

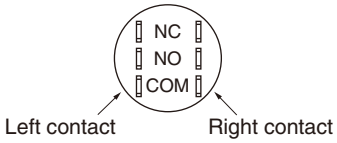
*1 "A" is standard.

AF15C • DF15C, AF16C • DF16C
Type numbers and dimensions

3-position

Operator (Thin type)	Contact arrangement	Type				Contact operation		
		Maintained/each 45°		Spring return/each 45°		Contact unit *1		Operator position *2
		IP40	IP65	IP40	IP65			1 2 3
Key with Flush square **AF15JTC,AF16JTC** 	2PDT	**AF15JTC-3■C2A** **AF15JSC-3■C2A** **AF15JRC-3■C2A**	**AF16JTC-3■C2A** **AF16JSC-3■C2A** **AF16JRC-3■C2A**	**AF15JTC-1EC2A** **AF15JSC-1EC2A** **AF15JRC-1EC2A**	**AF16JTC-1EC2A** **AF16JSC-1EC2A** **AF16JRC-1EC2A**	Left COM NC NO Right COM NC NO		● ●
Key with square bezel **AF15JSC,AF16JSC** 		Spring/manual return/each 45°		Spring/manual return/each 45°		Contact unit *1		Operator position *2
		IP40	IP65	IP40	IP65			1 2 3
Key with round bezel **AF15JRC,AF16JRC** 		**AF15JTC-6■C2A** **AF15JSC-6■C2A** **AF15JRC-6■C2A**	**AF16JTC-6■C2A** **AF16JSC-6■C2A** **AF16JRC-6■C2A**	**AF15JTC-7■C2A** **AF15JSC-7■C2A** **AF15JRC-7■C2A**	**AF16JTC-7■C2A** **AF16JSC-7■C2A** **AF16JRC-7■C2A**	Left COM NC NO Right COM NC NO		● ●

Notes: *1 Terminal arrangement of contact (view from terminal side).



*2 ●, ▬: Contact closed.

• The panel cutting dimensions differ depending on the operator shape of thin type model. See page 44.
• For the dimensions, see page 43.

• Key removable position

Replace the ■ mark by the removable positiom code.

Removable position		Applied operatior position				Code
		3	6	7	1	
Left	⊘	○	–	○	–	**A**
Left•Right	⊗	○	–	–	–	**B**
Left•Center•Right	⊛	○	–	–	–	**C**
Right	⊘	○	○	–	–	**D**
Center	⊙	○	○	○	○	**E**
Center•Right	⊙	○	○	–	–	**F**
Left•Center	⊙	○	–	○	–	**G**

○: Available –: Not available

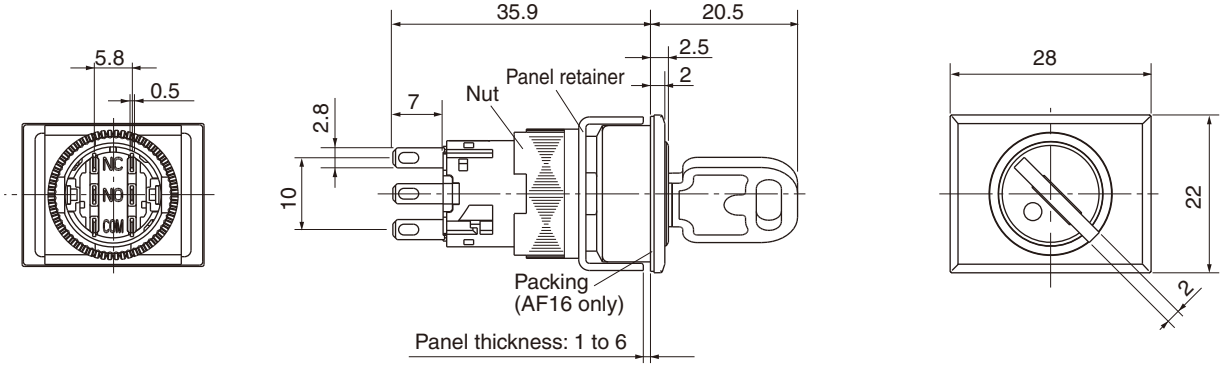
• Type of key

Type *1	A	B	C	D	E	F
Code	**A**	**B**	**C**	**D**	**E**	**F**

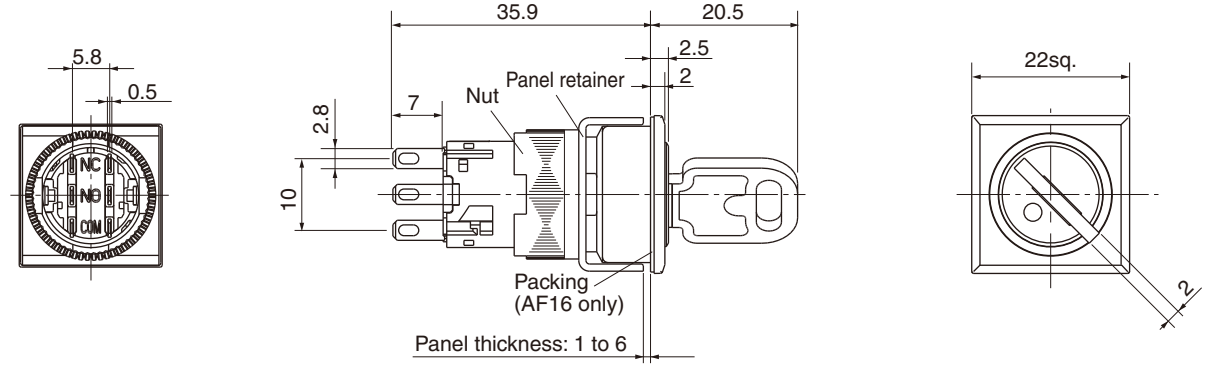
*1 "A" is standard.

• **Dimensions, mm**

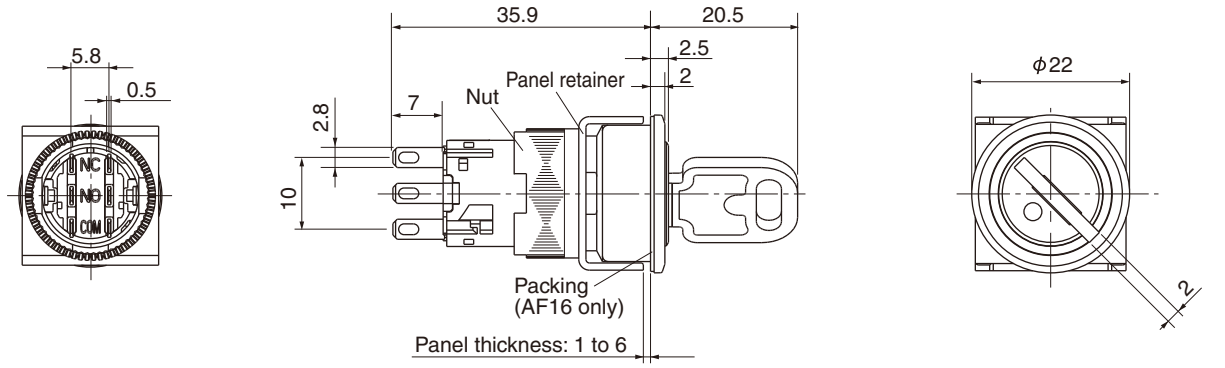
Key with recrangular bezel
AF15JTC and AF16JTC



Key with square bezel
AF15JSC and AF16JSC



Key with round bezel
AF15JRC and AF16JRC



Safety Precautions

Read the Operating Instructions carefully before mounting, wiring, operating, servicing, or inspecting the command switch. Make sure that the Operating Instructions is delivered to the final user of the command switch.

• The safety precautions are classified into two levels, Warning and Caution, with meanings described as follows:

⚠ Warning : If operation is incorrect, a dangerous situation may occur, resulting in death or serious injuries.

⚠ Caution : If operation is incorrect, a dangerous situation may occur, resulting in minor to medium injuries or physical damage to equipment.

An item described under CAUTION may result in a serious accident, depending on the situation.

⚠ Warning

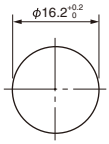
- Do not touch or approach any live part while power is supplied. An electric shock or burning may result.
- Be sure to turn off the power before mounting, dismounting, wiring, or inspecting the product. An electric shock, burning from short-circuiting or equipment malfunction may result.

⚠ Caution

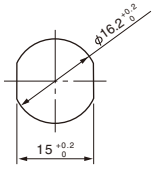
- Wire the product according to the wiring instructions in the Operating Instructions. Make sure that the size of the wires is suitable for the voltage and applied current. The wrong wiring may result in fire, accidents or malfunctions.
- Treat the product as industrial waste when it is to be discarded.

■ Panel cutout, mm

• **Standard type** (common)



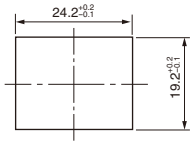
When requiring rotation prevention or positional stabilization



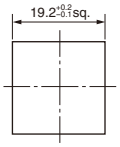
Note: When changing the operating angle position of the selector switch, the panel cutout also requires an angle change.

• **Thin type** (The panel cutout dimension varies depending on the operator or lens shape.)

• Rectangular type

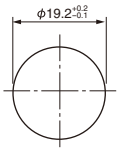


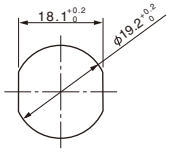
• Square type



When requiring rotation prevention or positional stabilization

• Round type



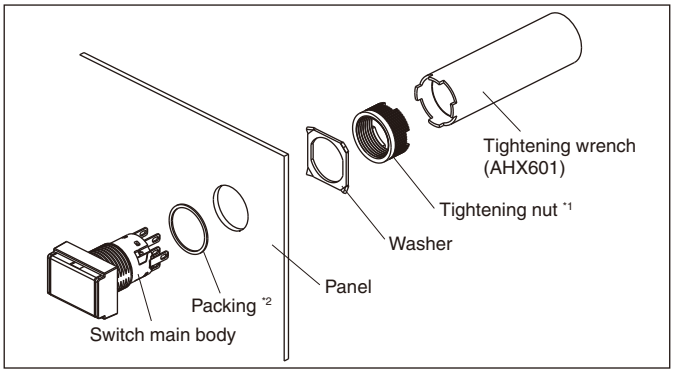


Note: When changing the operating angle position of the selector switch, the panel cutout also requires an angle change.

■ Installation on panel

• As shown in the figure below, insert the switch main unit into the mounting hole from the front of the panel, attach the washer and tightening nut from the back of the panel, and securely tighten the nut with the wrench (AHX601).

Note: The proper tightening torque is 0.6 to 1.0 N•m.

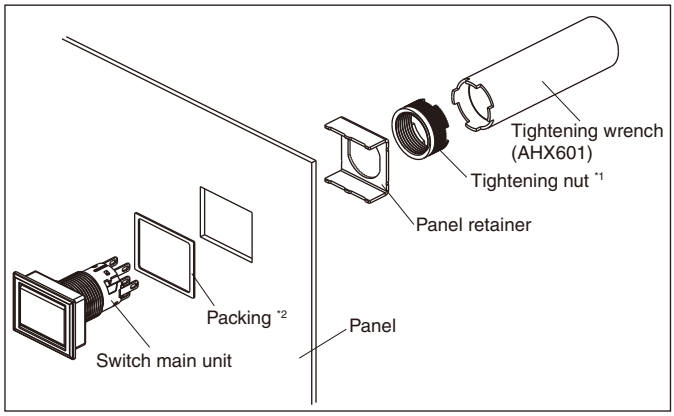


Note: *1 Do not use pliers or other improper tools to tighten the nut, or tighten it excessively, Otherwise, the nut may be damaged or the switch may malfunction.
*2 The packing is not enclosed with AR15C • DR15C series Switches.

• **Thin type**

As shown in the figure below, insert the switch main unit into the mounting hole from the front of the panel, attach the panel retainer from the back of the panel, and securely tighten the nut with the wrench (AHX601).

Note: The proper tightening torque is 0.6 to 1.0 N•m.



Note: *1 Do not use pliers or other improper tools to tighten the nut, or tighten it excessively, Otherwise, the nut may be damaged or the switch may malfunction.
*2 The packing is not enclosed with AF15C • DF15C series Switches.

■ Applicable panel thickness

Tables 1 and 2 show applicable panel thickness.

Table 1 Standard type (AR15C • DR15C, AR16C • DR16C series)

Mounting condition		Applicable panel thickness, mm
Without accessories		1 to 6
With accessories	Protective cover	1 to 4
	Dust-tight cover	1 to 4
	Various sockets	1 to 3.2
	Terminal cover	1 to 3.2
	Protective cover + various sockets	1 to 1.6
	Protective cover + Terminal cover	1 to 1.6
	Dust-tight cover + various sockets	Cannot be used.
	Dust-tight cover + Terminal cover	Cannot be used.

Table 2 Thin type (AF15C • DF15C, AF16C • DF16C series)

Mounting condition		Applicable panel thickness, mm
Without accessories		1 to 6
With accessories	Protective cover	1 to 4
	Various sockets	1 to 3.2
	Terminal cover	1 to 3.2
	Protective cover + various sockets	1 to 3.2
	Protective cover + Terminal cover	1 to 3.2

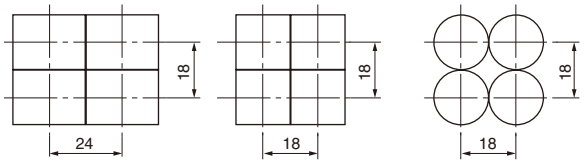
■ High-density mounting

Minimum mounting space (pitch) without accessories, mm

• Standard type (AR15C • DR15C, AR16C • DR16C series)

Illuminated pushbuttons, pushbuttons, selectors, and pilot lights

①Rectangular ②Square ③Round, dome

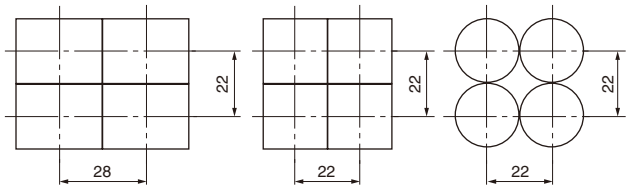


Note: Determine the mounting pitch by taking the operatbility and wiring work into consideration.

• Thin type (AF15C • DF15C, AF16C • DF16C series)

Illuminated pushbuttons, pushbuttons, selectors, and pilot lights

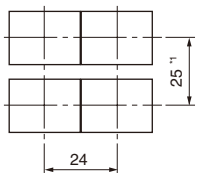
①Rectangular ②Square ③Round, dome



Note: Determine the mounting pitch by taking the operatbility and wiring work into consideration.

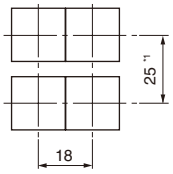
Minimum mounting space (pitch) with accessories, mm

• Protective cover AHX669 and AHX826 (Standard type)



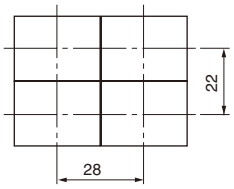
*1 43: with the cover fully opened

• Protective cover AHX671 (Standard type)

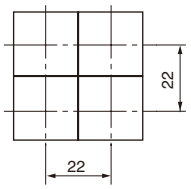


*1 43: with the cover fully opened

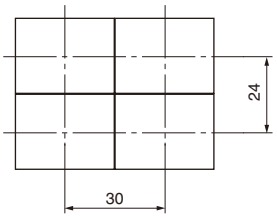
• Protective cover AF6D826 (Thin type)



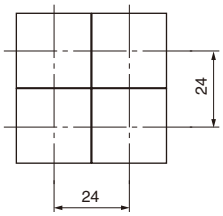
• Protective cover AF6D827 (Thin type)



• Dust-tight cover AHX668 (Standard type)



• Dust-tight cover AHX822 (Standard type)



• Minimum mounting spaces (pitch) with sockets, such as connector socket (AR6S691) and PC board-use socket (AR6S692) are the same as those without accessories.

Note: Determine the mounting pitch by taking the operability and wiring workability into consideration.

Safety Precautions

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⚠Warning : If operation is incorrect, a dangerous situation may occur, resulting in death or serious injuries.

⚠Caution : If operation is incorrect, a dangerous situation may occur, resulting in minor to medium injuries or physical damage to equipment.

An item described under CAUTION may result in a serious accident, depending on the situation.

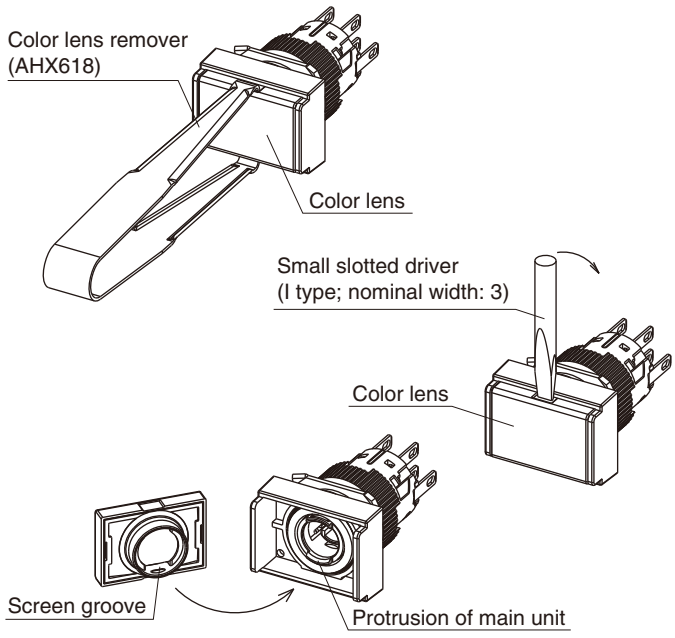
⚠Warning
• Do not touch or approach any live part while power is supplied. An electric shock or burning may result. • Be sure to turn off the power before mounting, dismounting, wiring, or inspecting the product. An electric shock, burning from short-circuiting, or equipment malfunction may result.

⚠Caution
• Wire the product according to the wiring instructions in the Operating Instructions. Make sure that the size of the wires is suitable for the voltage and applied current. The wrong wiring may result in fire, accidents, or malfunctions. • Treat the product as industrial waste when it is to be discarded.

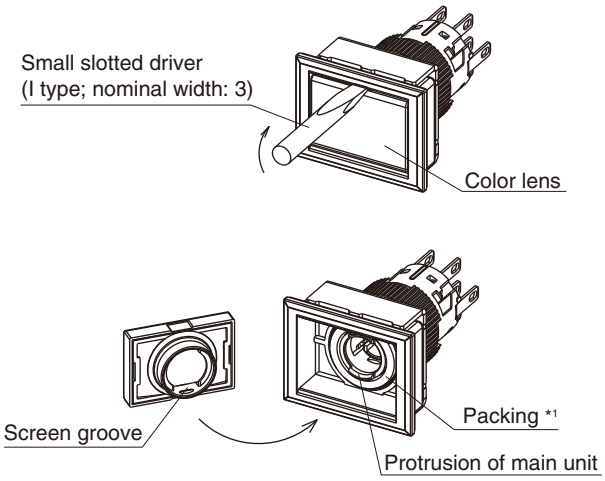
■ Method of replacing color lens, legend plate, and screen

Replacing color lens (screen)

• Standard type (AR15C • DR15C, AR16C • DR16C series)
To remove the color lens, fit the color lens remover (AHX618) to the grooves in the color lens and pull out the lens, or pry the lens lightly with a small slotted screwdriver.

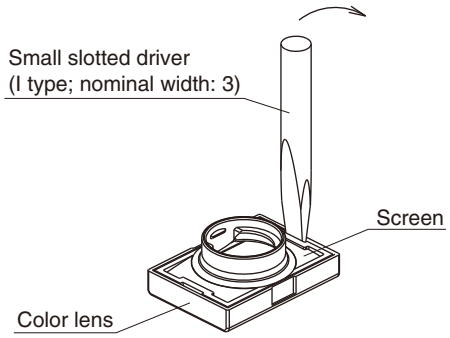


• Thin type (AF15C • DF15C, AF16C • DF16C series)
To remove the color lens, pry the lens lightly with a small slotted screwdriver.
If one side of the color lens is separated from the screen, further insert the screwdriver and remove the color lens together with the screen. Do not pry the packing when doing this.
To fit the color lens, align the protrusion of switch main body with the groove of the screen, and press-fit them.



Note: *1 A packing is not built into AF15C • DF15C series Switches.

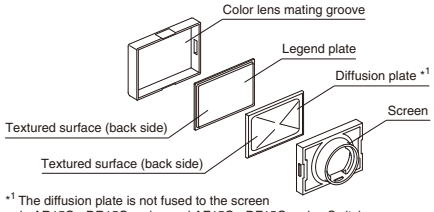
• Removing screen
Insert the tip of a small slotted screwdriver into the groove and press down the screwdriver in the direction of the arrow.



Fitting color lens to screen

• Rectangular, Square, Round type
(AR15C • DR15C, AF15C • DF15C series)

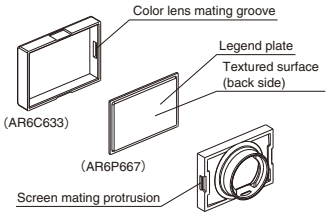
Place the textured surface of the diffusion plate on the screen, place the textured surface of the legend plate on the diffusion plate, and then press the color lens together.



*1 The diffusion plate is not fused to the screen in AR15C • DR15C series and AF15C • DF15C series Switches.

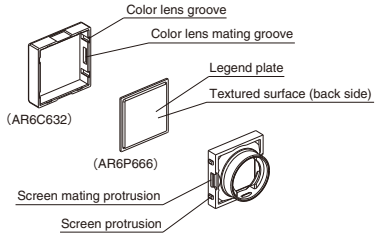
• Rectangular type (AR16C • DR16C, AF16C • DF16C series)

Set the textured surface side of the legend plate with the screen side, then press-fit the color lens. When press-fitting, make sure that your fingers do not touch the reflective surface inside the screen.



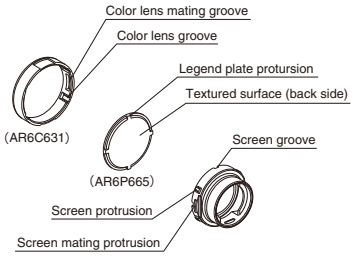
• Square type (AR16C • DR16C, AF16C • DF16C series)

Set the textured surface side of the legend plate with the screen side, align the screen protrusion with the color lens groove, and press-fit together. When press-fitting, make sure that your fingers do not touch the reflective surface inside the screen.



• Round type (AR16C • DR16C, AF16C • DF16C series)

Align the protrusion of the legend plate with the groove of the screen, also align the screen protrusion and color lens groove, and press-fit together. When press-fitting, make sure that your fingers do not touch the reflective surface inside the screen.



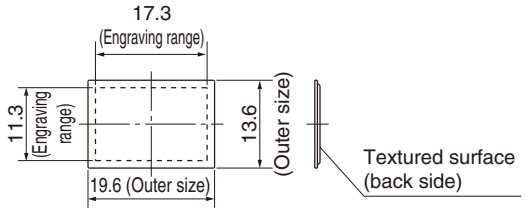
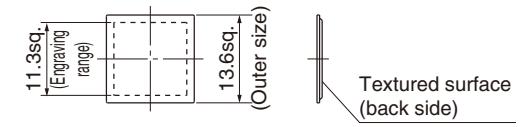
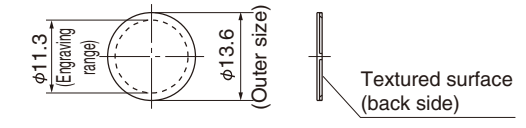
• For alternate action type of illuminated pushbutton switches and pushbutton switches, do not remove the color lenses (screens) in locked (depressed) state. The internal mechanisms may be damaged.

■ Engraving legend plate

Engrave the surface of the legend plate.

- Material: Acrylic resin
- Engraving depth: 0.5 mm max.
- Paint: Use a paint that has alcohol as its main ingredient, such as melamine paint, phthalic acid paint, or acrylic paint.

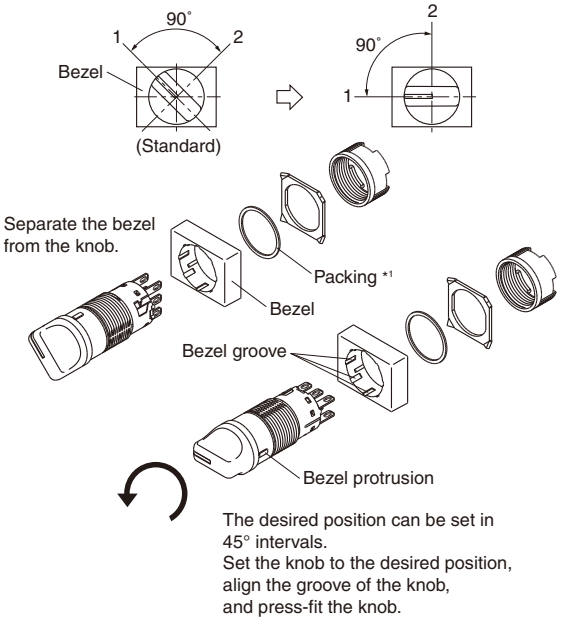
• Legend plate size

Shape	Size, mm
Rectangular	
Square	
Round	

Notes: *1 A legend sheet may be used, provided that the external dimensions do not exceed the corresponding outer size specified in the above table and that the thickness is 0.1 mm or below. (No legend sheets are provided with the product. Please prepare on customer side.)
*2 Do not engrave any part other than the legend plate.

■ Changing the operating angle position of selector switch

The bezel is separated from the knob (key), which makes it easy to change the operating angle position in 45° increments (the Standard type rectangular or square type only).
The following figures show a knob type example. The key type is the same.

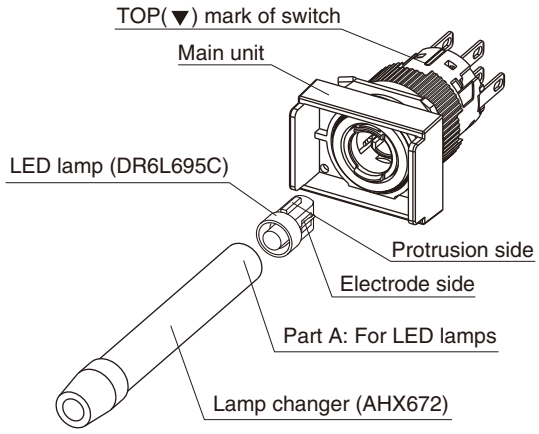


The desired position can be set in 45° intervals.
Set the knob to the desired position, align the groove of the knob, and press-fit the knob.

Note: *1 The packing is not enclosed with AR15 series Switches.

■ Method of replacing lamp

• To remove the LED lamp, insert the lamp changer (AHX672) in the LED lamp and pull out the LED lamp.
To mount the LED lamp, align TOP(▼) mark of switch with the Protrusion side of the LED lamp, lightly hold the lamp by hand or with the head of the lamp changer (AHX672), and insert the lamp.
The LED has polarity. It must be powered with DC.

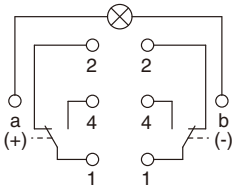
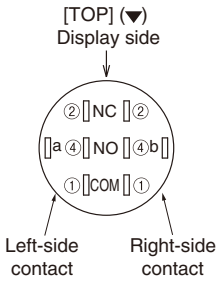
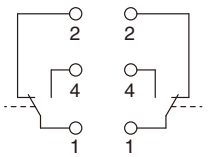
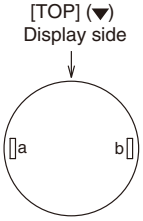


• Handling of LEDs
LED is sensitive to static electricity. Be careful when handling the LED. Take thorough measures against static electricity and surges when handling the product. The following anti-electrostatic measure is recommended.
Use a wristband or anti-electrostatic glove when replacing LED lamps.

■ Wiring

• Wiring to tab terminal
Use 110 (2.8mm) series receptacles for tab terminals. When you use the receptacles, use the following.
UNION. MACHINERY, CO.,LTD : 211012-0
J.S.T Mfg. Co., Ltd : STO-01T-110N
• Pay attention to the following points when soldering.
Type of solder: Use resin-core solder.
Use a soldering iron with a maximum power consumption of 60W (350(C) within five seconds. Make sure that the terminal is free of tension during soldering. Also, do not deform the terminal.
• The melting point of lead-free solder is slightly high, which may make soldering difficult. Use a soldering iron that has a large soldering tip or high heat generation.
• Connectable wires
Two solid wires with a maximum diameter of 0.8 mm (solder)
One stranded wire with a maximum area of 0.75 mm^2 (solder)
Flat-type connection terminal
(2.8□-1.25-5) 0.5 to 1.25mm^2
(2.8□-0.5-5) 0.2 to 0.5mm^2
• Use of contact blocks
When using NO and NC contacts in the same contact block, avoid connection that involves opposite polarity or wiring from different types of power supply.
• For wiring to adjacent terminals, use the terminal cover (AR6Y261) to prevent short-circuit, or an insulation tube to assure isolation. For solder terminals, caution is required if thick wires, in particular, are connected or a large quantity of solder is used.

• Terminal arrangement

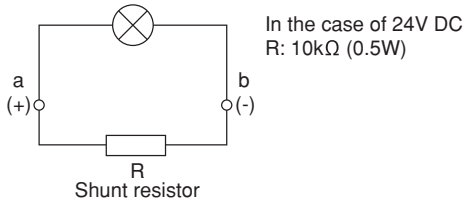
Model	Circuit diagram (example)	Terminal arrangement (view from the terminal (back) side)
Illuminated pushbuttons (2PDT)		
Pushbuttons and selector switches (2PDT)		
Pilot lights		

Note: Only the left-side contact is applicable to the SPDT mechanism.

■ LED Lamps

• LED lamp malfunctioning (incorrect lighting)
A minute current turns on the LED lamp. A leakage current from the surge absorption circuit or noncontact circuit, or stray capacitance between cables, may also turn on the LED lamp.
In this case, a countermeasure (e.g., attaching a resistor in parallel with the LED lamp) is required.

• Countermeasure against malfunctioning
Malfunctioning can be prevented by connecting a shunt resistor (R) in parallel. The resistance in that case varies with the model and operating conditions.



• The permissible fluctuation range for the operating voltage of the 12V or 24V model is ±10%. If the operating voltage is always 10% higher, select a resistor that will make the operating current the same as or lower than the rated current, and connect the resistor in series to the LED lamp.

• Calculation of external resistance
Example: Connecting a 24V red LED to a 48V circuit

$$\text{External resistance } [\Omega] = \frac{\text{Circuit voltage [V] - Rated voltage [V]}}{\text{Rated current [A]}}$$

$$= \frac{48\text{-}24}{11\times10^{-3}} = 2200\ [\Omega]$$

→Therefore, use an external resistor of 2.2kΩ 1W.
(Select a resistor with sufficient wattage.)

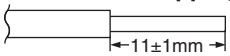
• Surges
LED products use elements that are sensitive to static electricity. Keep in mind that an unusual voltage, such as a surge voltage, may cause the product to malfunction.

■ Fast-connection socket

• Connectable wires
- Stranded wire : 0.3 to 0.75 mm^2 (AWG22 to AWG18)
- Single wire : 0.5 to 1 mm dia.
- Recommended ferrule : Phoenix Contact, part number AI0, 34-8TQ
  Wire size : 0.34 mm^2 (22 AWG)
  Crimping tool : CRIMPFOX UD6-6
  Note : Use a crimping tool with a hexagonal or round cross section.

Sheath external diameter: 2.8 mm dia. Max.

• Wire sheath stripping length



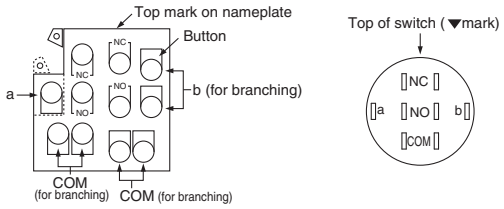
Note : If ferrules are used, securely insert the wire sheath inside a resin shell. Cut the end of the wire the same length as the ferrule or cut it at a position approximately 0.5 mm longer.

Check the length using the strip gauge on the surface of the socket displayed on the model nameplate. If standed wire is used, twist the wire so that there are no loose strands after stripping.

• Connection method

(1) Insert the wire while pressing the button on the insertion slot with a small flat-head screwdriver (tip width of 2 mm max.). Release the button when the wire is all the way seated in the switch.
(2) When disconnecting the wire, pull out the wire while pressing the button on the insertion slot with a small flat-head screwdriver. Cut the bare part of the wire if it was previously used, and then newly remove the sheath to reuse the wire.
(3) Insert a single wire for each insertion slot.
(4) Do not pull on the wires with excessive force (15 N or more) when you perform wiring. Make sure that not extemal force is exerted on the wires after wiring has been completed. The next time that a wire is inserted, the parts that support the wire may change shape and result in conduction failure.

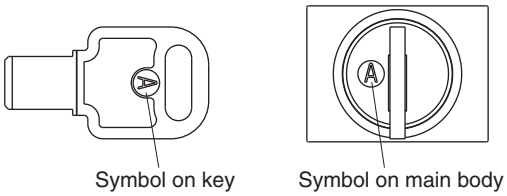
• Terminal arrangement (Rear-side View)



■ Selector Switches

• Knob type
The knob can be operated by turning it lightly. Be careful to operate the knob with a torque not exceeding 1N•m.

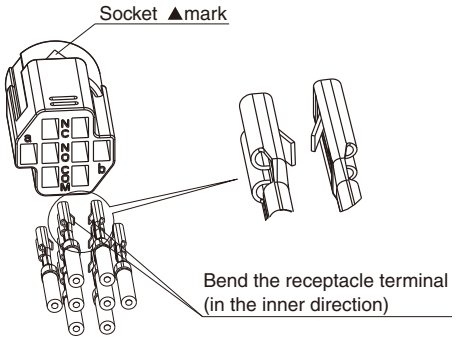
• Key type
• Types of keys
Five types (B, C, D, E, and F) are available in addition to the standard type (type A).
Make sure that the symbol on the key coincides with the symbol on the switch.



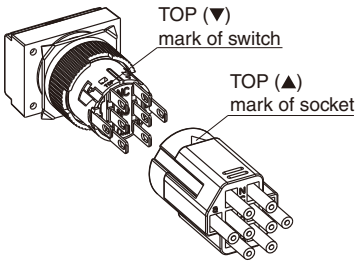
• Fully insert the key into the switch and turn the key. Do not pull on the key while turning it.
• Operate the key with a torque not exceeding 0.1N•m.
• Do not forcibly insert or extract the key.
• Do not attempt to operate the switch with the key insufficiently inserted or insert the wrong key. Otherwise, a malfunction may result.

■ Connector sockets

- Connectable wires
  Stranded wire: 0.5 to 0.75 mm^2 (AWG20 to AWG18)
- Arrange for a receptacle terminal separately.
  UNION. MACHINERY, CO.,LTD : 211012-0
- Check the insertion position and insert the receptacle terminal into the socket after connecting the wires to the receptacle terminal. (The wires once connected cannot be disconnected.) Lightly pull the wires and check that the receptacle terminal is securely connected to the socket.

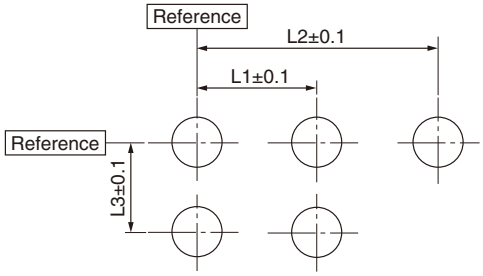


- Align the ▲ mark of the socket and the TOP (▼) mark of the switch, and put the socket and switch together.



■ Socket for PC board

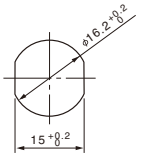
- Minimum mounting space (pitch), mm



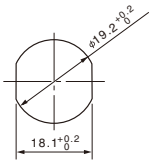
Obtain the mounting pitch based on a reference line to minimize the cumulative error.
Make sure that the centering difference between the switch and the PCB socket does not exceed 0.25 mm.

- Apply the following panel cutout dimensions (in mm) to stabilize the operator position of the switch when combined with the socket.

Standard type (common)

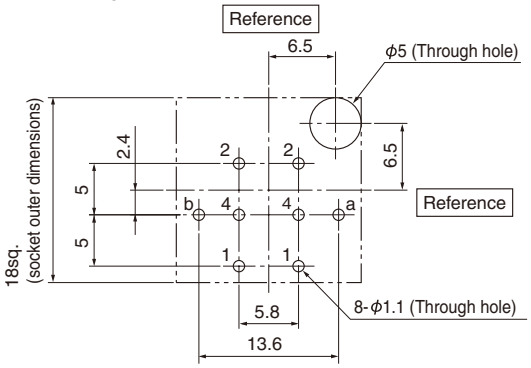


Thin type (round type)

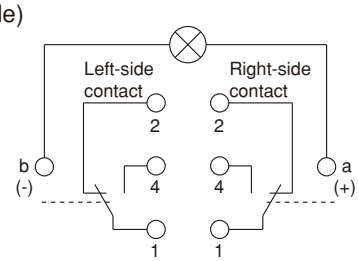


- Mount the switch to the panel. Make sure that the switch is free of any bends.

- PC board processing dimensions (in mm) as viewed from the socket mounting side.

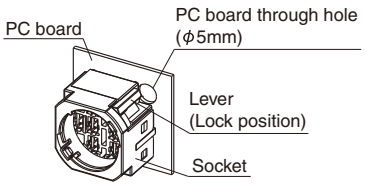


- The reference is the center of the socket (switch).
- Switch terminal arrangement (as viewed from the socket mounting side)

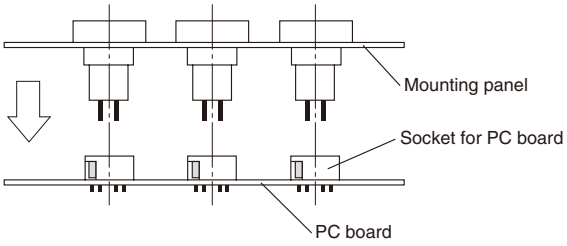


Note: The right-side contact is connected in the case of an SPDT contact.

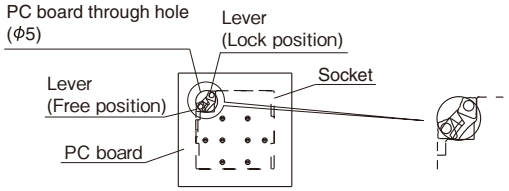
- Insert the socket so that the lever will be located in the 5mm-diameter through hole of the PC board. Set the lever to the lock position as viewed from the socket mounting side.



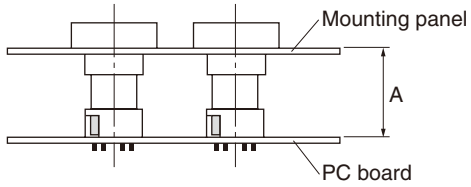
- Combine the switch-mounted panel with the socket on the PC board, and solder the socket terminal.



- Combine the PCB socket and the panel while making sure that the socket terminal does not fall off, and turn over the socket to do the soldering. Do not leave any space between the PC board and socket.
- After combining them, check that the lever as viewed from the soldering side is in the lock position, and solder the terminal.



- Pay attention to the following points when soldering.
  - Type of solder: Use resin-core solder.
  - Finish soldering at 350°C within 5 seconds.
  - Do not wash the socket.
  - Solder the socket so that no flux adheres to it.
- The melting point of lead-free solder is slightly higher than lead solder, which may make soldering difficult. Use a soldering iron with a large tip or that provides a high heat generation.
- Using a spacer between the panel and the PC board
  Make sure that the distance shown in the figure below is maintained between the panel and the PC board. The spacer dimensions vary with the thickness of the mounting panel.



Type	A (mm)
Standard type	30.2±0.2
Thin type	37.7±0.2

- Mounting and removing PC board sockets
  - Removing
    Push down the socket levers all the way viewed from the soldering side in the direction of the free position and remove the PC board sockets. After removal, the socket levers will return to the lock position automatically.
  - Mounting
    Check that the socket lever as viewed from the soldering side is in the lock position, lightly insert the terminal and socket so their position is aligned with the switch on the panel, press the socket-mounting portion of the PC board, and securely insert the entire socket until the socket lever snaps. (Check that the lever as viewed from the soldering side is in the lock position.)
- Use the switch within the following rated voltage range when the PCB socket is used.
  - Rated insulation voltage: 60V
  - Rated operational voltage: 24V
- Use a 1.6-mm-thick double-sided through-hole printed circuit board made of copper-plated laminated epoxy resin on a woven glass fabric base.
- In case of standard type (AR15C • DR15C and AR16C • DR16C series), beware that the adopted models are not allowed to attach the protective cover to some models and that the adopted models cannot be mounted to some models afterward.

■ Others

- Operation
  Do not hit or flip the button, or the button may be damaged.
  Be sure to operate the button by hand.
  Do not pull the button if the switch is an alternate action type.

- High-density mounting of illuminated type
  When continuously lighting pilot lights or pressing illuminated pushbuttons, keep in mind that the ambient temperature may exceed the rated value due to the heat radiated by the lamp. Be sure to ventilate the lamp /switch if the mounting panel is not made of metal or if the mounting panel is an enclosed type.

- Usage locations
  - Be sure to use and store the product within the rated ambient temperature and humidity ranges.
  - Although the product resists ordinary cutting oils and coolant oils, do not use the unit in places where special oils may be sprayed onto the product. (AR16C • DR16C series and AF16C • DF16C series only)
  - If dusts or filings accumulate in the gap between the button and the frame, the switch may fail to operate normally. Take appropriate measures, such as using a dust-proof protective cover, if the switch is to be used in places that are subject to dusts or filings.
  - The AR15C • DR15C, AF15C • DF15C series and AR16C • DR16C, AF16C • DF16C series are for indoor use. Make sure that the product is not exposed to direct sunlight.
  - Do not use the product in the places that are subject to the adverse effects of ozone or corrosive gases.

Protective cover (for Standard type)


KKD07-246


KKD07-247

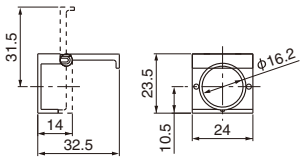

KKD07-248

Type	Used with
AHX669	AR15F0NC, F5NC, F0TC, F5TC AR16F0NC, F5NC, F0TC, F5TC
AXH826 *	
AHX671	AR15F0MC, F5MC, F0SC, F5SC AR15E0LC, E5LC, E0RC, E5RC AR16F0MC, F5MC, F0SC, F5SC AR16E0LC, E5LC, E0RC, E5RC

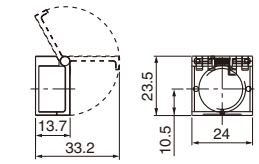
* This cover returns to the home position with spring action to prevent accidental operation (Packing is provided).

Note: The cover cannot be used with the flush rectangular with guard type models.

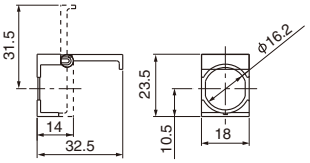
AHX669



AHX826



AHX671



Protective cover (for Thin type)


KKD07-249


KKD07-250

Type	Used with
AF6D826-☐	AF15F0NC, F0TC AF16F0NC, F0TC
AF6D827-☐	AF15F0MC, F0SC AF16F0MC, F0SC

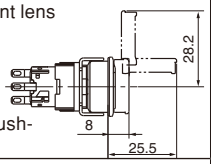
This cover prevents accidental operation.

Note: • The protective cover and the button are made of an integral structure.
• Enter the color code in the square box.

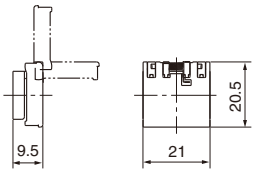
Color	Green	Red	Transparent *	Yellow	Orange	Blue
Code	**G**	**R**	**C**	**Y**	**A**	**S**
Color code of main unit	G	R	W, B	Y	A	S

* When the color code of the main unit is W, a combination of the transparent lens and the white legend plate comes to white. When it is B, a combination of the transparent lens and the black legend plate comes to black.

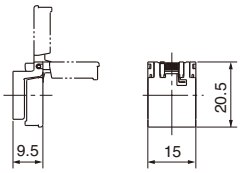
• This cover returns to the home position with spring action.
• Not applicable to alternate models.
• Dimensions when connected with a push-button switch (unit: mm)



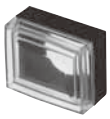
AF6D826

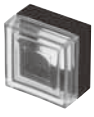


AF6D827



Dust-proof cover (for Standard type)

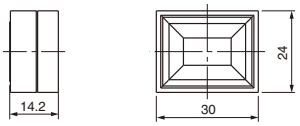

KKD07-251


KKD07-252

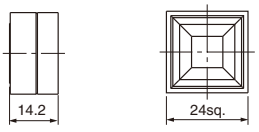
Type	Used with
AHX668	AR16F0NC, F5NC, F0TC, F5TC
AHX822	AR16F0MC, F5MC, F0SC, F5SC AR16E0LC, E5LC, E0RC, E5RC

This cover seals the operator section to prevent powder or dust from invading inside the switch (Packing is provided).

AHX668



AHX822



Terminal cover

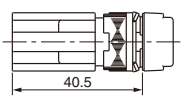

KKD07-253

Type	Used with
AR6Y261	Illuminated pushbutton switch, pushbutton switch, selector switch, pilot light

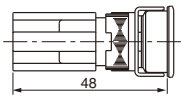
Protective cover for insulation between terminals and live parts.

Note: • Dimensions when connected with a switch (pilot light) (unit: mm)

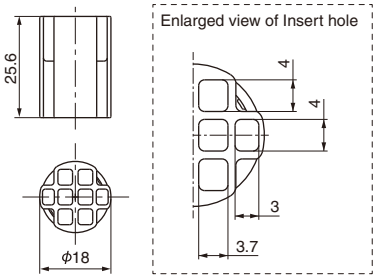
Standard type



Thin type



• Wiring work should be made first, and attach the cover to the switch (pilot light).
• Refer to the dimensions in the diagram on the right for the applicable wires.



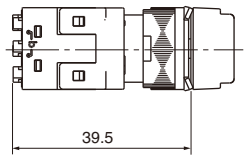
Fast-connection socket

KKD08-093

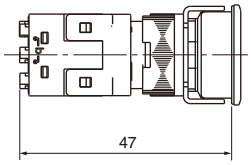
Type	Used with
AR6S690-L1	Illuminated pushbutton switch : SPDT
AR6S690-L2	Illuminated pushbutton switch : 2PDT
AR6S690-LX	Pilot light
AR6S690-R1	Pushbutton switch, selector switch : SPDT
AR6S690-R2	Pushbutton switch, selector switch : 2PDT

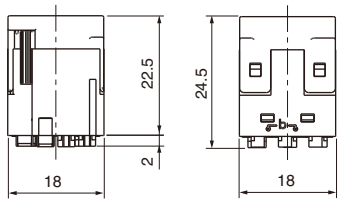
By combining with a switch, they can be used as a Fast-connection type switch.
Note: Dimensions when connected with a switch (pilot light)
(unit:mm)

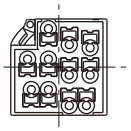
Standard type



Thin type







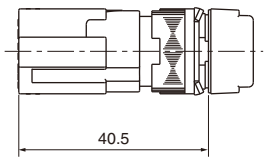
Socket for connector

KKD07-255

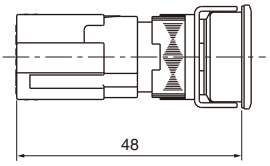
Type	Used with
AR6S691-C	Illuminated pushbutton switch, pushbutton switch, selector switch, pilot light

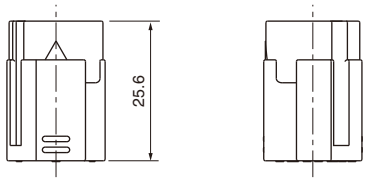
By combining with receptacle terminals, this can be used as a connector.
Note: • The receptacle terminal is not supplied.
Please prepare the receptacle terminal Model No. UNION. MACHINERY, CO.,LTD : 211012-0 on your side.
• Dimensions when connected with a switch (pilot light)
(unit: mm)

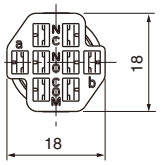
Standard type



Thin type







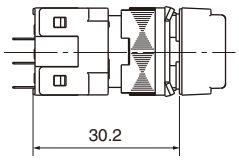
Socket for PC board

KKD07-306

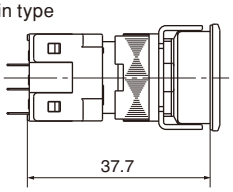
Type	Used with
AR6S692	Illuminated pushbutton switch, pushbutton switch, selector switch, pilot light

By combining with a switch, they can be used as a switch for PC board, connection type switch.
Note: • Dimensions when connected with a switch (pilot light)
(unit: mm)

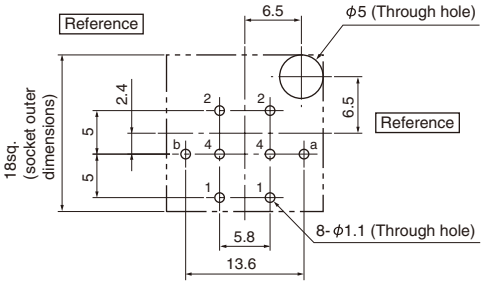
Standard type

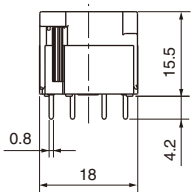


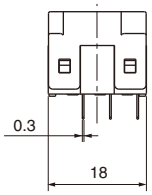
Thin type

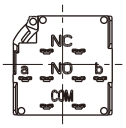


• PC board processing drawing (View from component side)
(unit: mm)







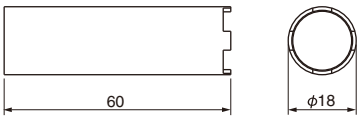


Wrench


KKD07-257

Type	Used with
AHX601	AR15C • DR15C series, AF15C • DF15C series, AR16C • DR16C series, AF16C • DF16C series

When installing a Command Switch on a panel, this tool enables secure and firm tightening.

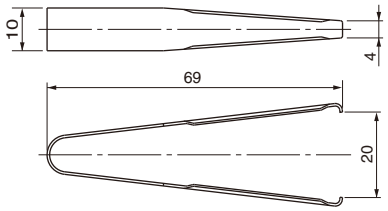


Remover (for Standard type)

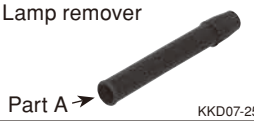

KKD07-258

Type	Used with
AHX618	Illuminated pushbutton switch, pushbutton switch, pilot light

This tool is used for removing color lens, buttons or screens.



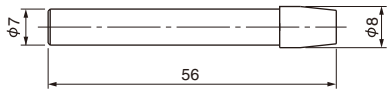
Lamp remover



KKD07-259

Type	Used with
AHX672	Illuminated pushbutton switch, pilot light

This tool is used for installing or removing lamps.
Use the part A to remove LED lamps.



Panel plug (for Standard type)


KKD07-260


KKD07-261


KKD07-262

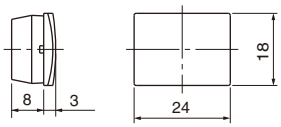

KKD07-267

Type	Used with
AXH645-☐	Rectangular type Degree of protection: IP40
AXH644-☐	Square type Degree of protection: IP40
AXH622-☐	Round type Degree of protection: IP40
AXH850-B [*1]	Rectangular type Degree of protection: IP65

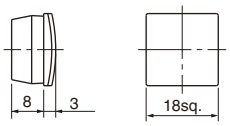
[*1] Packing and nut are provided. The color is black only.
Note: • Enter the color code in the square box ☐.

Type	Black	Gray
Code	**B**	**GY**

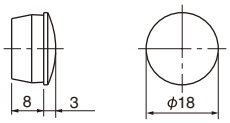
AHX645



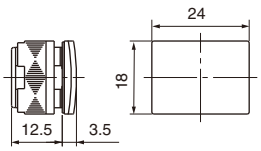
AHX644



AHX622



AHX850-B



Panel plug (for Thin type)


KKD07-264


KKD07-266


KKD07-265


KKD07-263

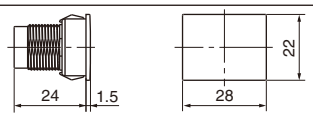

KKD07-268


KKD07-269

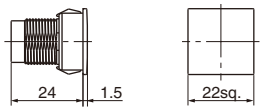
Type	Used with
AF6Y645-B	Rectangular type Degree of protection: IP40
AF6Y644-B	Square type Degree of protection: IP40
AF6Y622-B	Round type Degree of protection: IP40
AF6Y850-B [*1]	Rectangular type Degree of protection: IP65
AF6Y851-B [*1]	Square type Degree of protection: IP65
AF6Y852-B [*1]	Round type Degree of protection: IP65

[*1] Packing, panel retainer, and nut are provided.
Note: • The color is black only.

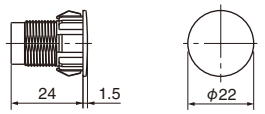
AF6Y645-B



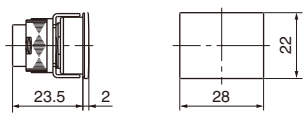
AF6Y644-B



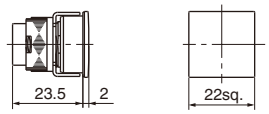
AF6Y622-B



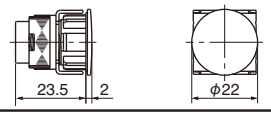
AF6Y850-B



AF6Y851-B



AF6Y852-B



Color lens and button

KKD07-270

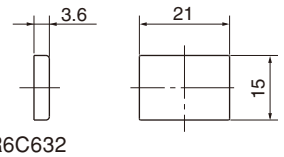
Type	Used with
AR6C633-☐	AR15F0NC, F5NC, F0TC, F5TC, G0NC, G5NC, G0TC, G5TC AR16F0NC, F5NC, F0TC, F5TC, G0NC, G5NC, G0TC, G5TC DR15F0NC • DR16F0NC AF15F0NC, F5NC, F0TC, F5TC AF16F0NC, F5NC, F0TC, F5TC DF15F0NC • DF16F0NC
AR6C632-☐	AR15F0MC, F5MC, F0SC, F5SC • AR16F0MC, F5MC, F0SC, F5SC DR15F0MC • DR16F0MC AF15F0MC, F5MC, F0SC, F5SC • AF16F0MC, F5MC, F0SC, F5SC DF15F0MC • DF16F0MC
AR6C631-☐	AR15E0LC, E5LC, E0RC, E5RC • AR16E0LC, E5LC, E0RC, E5RC DR15E0LC • DR16E0LC AF15F0LC, F5LC, F0RC, F5RC • AF16F0LC, F5LC, F0RC, F5RC DF15F0LC • DF16F0LC
DR6C630-☐	DR15D0LC • DR16D0LC

Note: Enter the color code in the square box ☐.

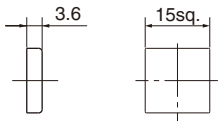
Color	Green	Red	Transparent*	Yellow	Orange	Blue
Code	**G**	**R**	**C**	**Y**	**A**	**S**
Color code of main unit	G	R	W, B	Y	A	S

* When the color code of the main unit is W, a combination of the transparent lens and the white legend plate comes to white (except for dome type).
When it is B, a combination of the transparent lens and the black legend plate comes to black (except for pilot light).
When the dome type (DR15D0LC, DR16D0LC)'s color code of the main unit is W, the lens code is W.

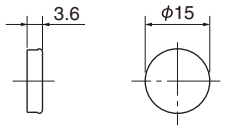
AR6C633



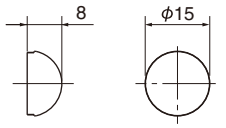
AR6C632



AR6C631



DR6C630



Legend plate

KKD07-272

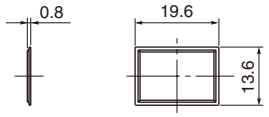
Type	Used with
AR6P667-☐	AR15F0NC, F5NC, F0TC, F5TC, G0NC, G5NC, G0TC, G5TC AR16F0NC, F5NC, F0TC, F5TC, G0NC, G5NC, G0TC, G5TC DR15F0NC • DR16F0NC AF15F0NC, F5NC, F0TC, F5TC AF16F0NC, F5NC, F0TC, F5TC DF15F0NC • DF16F0NC
AR6P666-☐	AR15F0MC, F5MC, F0SC, F5SC • AR16F0MC, F5MC, F0SC, F5SC DR15F0MC • DR16F0MC AF15F0MC, F5MC, F0SC, F5SC • AF16F0MC, F5MC, F0SC, F5SC DF15F0MC • DF16F0MC
AR6P665-☐	AR15E0LC, E5LC, E0RC, E5RC • AR16E0LC, E5LC, E0RC, E5RC DR15E0LC • DR16E0LC AF15F0LC, F5LC, F0RC, F5RC • AF16F0LC, F5LC, F0RC, F5RC DF15F0LC • DF16F0LC

Note: Enter the color code in the square box ☐.

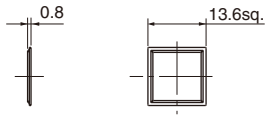
Type	White	Black
Code	**W**	**B**
Color code of main unit	G, R, W, Y, A, S	B

• When the color code of the main unit is W, a combination of the transparent lens and the white legend plate comes to white.
When it is B, a combination of the transparent lens and the black legend plate comes to black (except for pilot light).

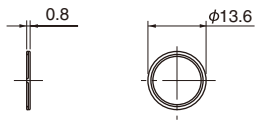
AR6P667



AR6P666



AR6P665



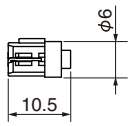
LED lamp

KKD13-036

Type	Lamp operational voltage, current consumption
DR6L695C-B☐	Green, Red, Amber, Blue: 9 to 10.5mA DC White: 4.5 to 5.5ma DC
DR6L695C-E☐	

Note: Enter the color code in the square box ☐.

Color	Green	Red	White		Amber	Blue
Code	**G**	**R**	**P**		**A**	**S**
Color code of main unit	G	R	W	Y	A	S



Key

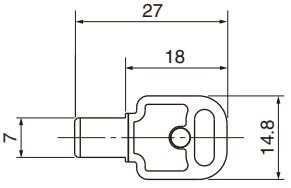
KKD07-274

Type	Used with
AR6C662-☐	AR15JTC/JSC/JRC AR16JTC/JSC/JRC AF15JTC/JSC/JRC AF16JTC/JSC/JRC

Note: • Enter the color code in the square box ☐.

Code (Key type)	**A**	**B**	**C**	**D**	**E**	**F**

• Two pieces per set on delivery.
• Both sides of the key is same.



t: 2mm

Mass

• Standard type <AR15C • DR15C, AR16C • DR16C series>

1. Illuminated push button switches (g)

Operator shape	AR15		AR16	
	SPDT	2PDT	SPDT	2PDT
F0NC	9.1	9.7	9.3	9.9
F5NC	9.1	9.7	9.3	9.9
G0NC	9.2	9.8	9.4	10
G5NC	9.2	9.8	9.4	10
F0MC	8.5	9.1	8.7	9.3
F5MC	8.5	9.1	8.7	9.3
E0LC	7.9	8.5	8.1	8.7
E5LC	7.9	8.5	8.1	8.7

2. Pushbutton switches (g)

Operator shape	AR15		AR16	
	SPDT	2PDT	SPDT	2PDT
F0TC	8.3	8.9	8.5	9.1
F5TC	8.3	8.9	8.5	9.1
G0TC	8.5	9.1	8.7	9.3
G5TC	8.5	9.1	8.7	9.3
F0SC	7.8	8.4	8	8.6
F5SC	7.8	8.4	8	8.6
E0RC	7.2	7.8	7.4	8
E5RC	7.2	7.8	7.4	8

3. Pilot lights (g)

Operator shape	DR15	DR16
F0NC	8.5	8.7
F0MC	7.9	8.1
E0LC	7.3	7.5
D0LC	7.3	7.5

4. Selector switches (knob type) (g)

Operator shape	AR15		AR16	
	SPDT	2PDT	SPDT	2PDT
PTC	9.5	10.1	9.6	10.2
PSC	8.5	9.1	8.6	9.2
PRC	8.2	8.8	8.3	8.9

5. Selector switches (key type) (g)

Operator shape	AR15		AR16	
	SPDT	2PDT	SPDT	2PDT
JTC	23.1	23.7	23.2	23.8
JSC	22.2	22.8	22.3	22.9
JRC	21.8	22.4	21.9	22.5

Note: The value when two keys are attached.

• Thin type <AF15C • DF15C, AF16C • DF16C series>

1. Illuminated push button switches (g)

Operator shape	AF15		AF16	
	SPDT	2PDT	SPDT	2PDT
F0NC	13.3	13.9	13.5	14.1
F5NC	13.3	13.9	13.5	14.1
F0MC	12.6	13.2	12.8	13.4
F5MC	12.6	13.2	12.8	13.4
F0LC	11.8	12.4	12	12.6
F5LC	11.8	12.4	12	12.6

2. Pushbutton switches (g)

Operator shape	AF15		AF16	
	SPDT	2PDT	SPDT	2PDT
F0TC	12.5	13.1	12.7	13.3
F5TC	12.5	13.1	12.7	13.3
F0SC	11.8	12.4	12	12.6
F5SC	11.8	12.4	12	12.6
F0RC	11.1	11.7	11.3	11.9
F5RC	11.1	11.7	11.3	11.9

3. Pilot lights (g)

Operator shape	DF15	DF16
F0NC	12.6	12.8
F0MC	11.9	12.1
F0LC	11.2	11.4

4. Selector switches (knob type) (g)

Operator shape	AF15		AF16	
	SPDT	2PDT	SPDT	2PDT
PTC	14.1	14.7	14.2	14.8
PSC	13.6	14.2	13.7	14.3
PRC	13	13.6	13.1	13.7

5. Selector switches (key type) (g)

Operator shape	AF15		AF16	
	SPDT	2PDT	SPDT	2PDT
JTC	27.7	28.3	27.8	28.4
JSC	27.2	27.8	27.3	27.9
JRC	26.7	27.3	26.8	27.4

Note: The value when two keys are attached.

Integrated Contacts Structure Emergency stop pushbutton switches AR16V

■ Features

- Up to four sets of contacts in a one-piece structure with a panel depth dimension of 28 mm (non-illuminated type).

Non illuminated type

Illuminated type

- Both pull or turn reset methods are supported.
- Two button diameters are available: 32 mm (AR16V0) and 40 mm (AR16V1).
- Safety trigger-action mechanism that prevents the contacts from operating until the switch is locked, even if people or objects accidentally come into contact with the switch.
- Direct opening mechanism for NC contacts to ensure that the contacts can be opened even in the unlikely event that they become fused. ⊖
- IP65 protection for operating section.

AR16V0R

AR16V1L

- RoHS compliance (EU Directive 2002/95/EC) is a standard feature.
- Compliance with UL/CSA standards, China Compulsory Certification (CCC) standards, and TÜV (EN standards).
- CE marking.

■ Specifications (indoor use)

Item		AR16V
Rated insulation voltage Ui		250V AC/DC
Durability	Mechanical	100,000 operations
	Electrical	100,000 operations (AC-15, AC-13, AC-12, DC-13, DC-12)
Operating frequency		1200 operations / hour (On-load factor : 40%)
Withstand voltage	Between live section and grounding	2000V AC, 1 minute
	Between opposite polarity live sections	2000V AC, 1 minute
Insulation resistance		100MΩ or more (500V DC megger)
Rated impulse withstand voltage Uimp		2.5kV
Conditional short-circuit current		1000A
Short-circuit protective device		gG 6A (IEC60269 Fuse)
Pollution degree		3
Vibration		Operating extremes : frequency 10 to 500 Hz, double amplitude 0.7mm acceleration 50m/s^2 Damage limits : frequency 10 to 500 Hz, double amplitude 0.7mm acceleration 50m/s^2
Shock		Malfunction durability : 100m/s^2 Mchanical durability : 500m/s^2
Operational ambient temperature		-10 to +55°C (no icing or no condensation)
Storage temperature		-40 to +70°C
Relative humidity (inside control panel)		45 to 85%RH (-5 to 40°C) (no icing or no condensation)
Degree of protection of operating (displaying) section		IP65 (dust-ploof, water jet proof): IEC 60529
Degree of protection of control section		IP2X (Terminal cover : AR6Y262, At the connection)
Terminal style		Solder terminal
Connectable wire		Stranded wire: 0.75mm^2 maximun (18AWG maximun) Solid wire: 1.0mm diameter maximum

■ Contact ratings

• TÜV (EN60947-5-1), CCC(GB14048.5), JIS C 8201-5-1

Conventional free air thermal current I th	Rated operational current					
	Rated operational voltage Ue	AC			DC	
		AC-12 (Resistive load)	AC-13 (Inductive load)	AC-15 (Inductive load)	DC-12 (Resistive load)	DC-13 (Inductive load)
5A	24V	—	—	—	1.0A	0.7A
	120V	1.5A	1.0A	0.3A	—	—
	125V	—	—	—	0.2A	0.15A
	240V	1.0A	0.7A	0.3A	—	—

• UL/CSA

• AC (COSø=0.35)

Contact rating code	120V		240V	
	Making current	Braeking current	Making current	Braeking current
C300	15A	1.5A	7.5A	0.75A

• DC ($T_{0.95}$=6P)

Contact rating code	Making current · Braeking current	
	125V	250V
R300	0.22A	0.11A

■ Contact reliability

• FUJI has confirmed that the product can be used in 1mA circuit conditions at 5V AC or DC. The operable range, however, may vary deperding on the operational ambient conditions and type of load.

■ Operating characteristic

Operation	Push-lock, turn-reset or pull-reset
Ave. required operating force	25N
Operating travel	Approx. 5.4mm
Operation angle	Approx. 45°
Required return force (pull-reset)	20N
Required return force (tarn-reset)	0.3N • m

■ Standards approved

UL508	cUL File No. E44592
CSA C22.2 No.14	
TÜV : EN60947-5-1, EN60947-5-5	R50136611
CCC: GB14048.5	2003010305071068

■ Lamp rating and current consumption

Applied method	Type of lamp	Luminous color	Lamp rated voltage	Current consumption
Without transformer	LED lamp	Red	6V AC/DC	9mA AC, 7.5mA DC
			12V AC/DC	7.5mA AC, 7.5mA DC
			24V AC/DC	7.5mA AC, 7.5mA DC

■ Type

• Emergency stop pushbutton switches

Operator	Contact	Type
Unibody push-lock, pull or turn-reset (32mm dia.)	1NC	AR16V0R-01R
	1NO+1NC	AR16V0R-11R
	2NC	AR16V0R-02R
	1NO+2NC	AR16V0R-12R
	3NC	AR16V0R-03R
	1NO+3NC	AR16V0R-13R
 (KKD12-068)	4NC	AR16V0R-04R
Unibody push-lock, pull or turn-reset (40mm dia.)	1NC	AR16V1R-01R
	1NO+1NC	AR16V1R-11R
	2NC	AR16V1R-02R
	1NO+2NC	AR16V1R-12R
	3NC	AR16V1R-03R
	1NO+3NC	AR16V1R-13R
 (KKD12-071)	4NC	AR16V1R-04R

• Emergency stop illuminated pushbutton switches

Operator	Contact	LED Lamp Type
Unibody push-lock, pull or turn-reset (32mm dia.)	1NC	AR16V0L-01□R
	1NO+1NC	AR16V0L-11□R
	2NC	AR16V0L-02□R
	1NO+2NC	AR16V0L-12□R
	3NC	AR16V0L-03□R
	1NO+3NC	AR16V0L-13□R
 (KKD12-066)	4NC	AR16V0L-04□R
Unibody push-lock, pull or turn-reset (40mm dia.)	1NC	AR16V1L-01□R
	1NO+1NC	AR16V1L-11□R
	2NC	AR16V1L-02□R
	1NO+2NC	AR16V1L-12□R
	3NC	AR16V1L-03□R
	1NO+3NC	AR16V1L-13□R
 (KKD12-070)	4NC	AR16V1L-04□R

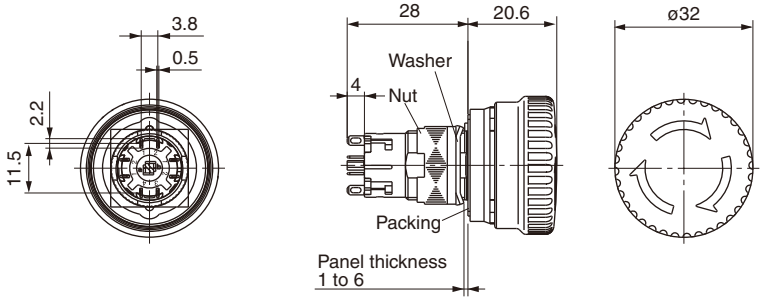
• Voltage Replace the □ mark by the lamp voltage code

Lamp voltage	Code
6V AC/DC	A3
12V AC/DC	B3
24V AC/DC	E3

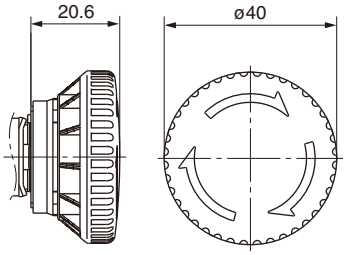
■ Dimensions, mm

• Emergency stop pushbutton switches

• AR16V0R

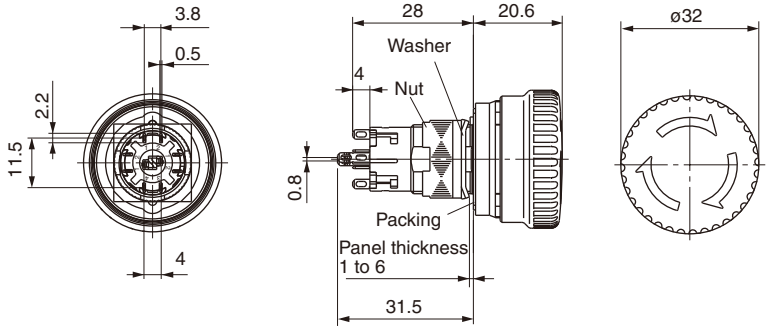


• AR16V1R

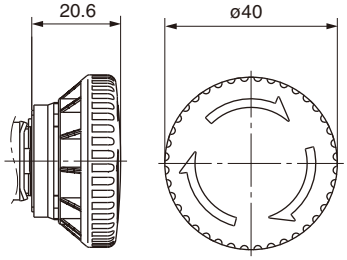


• Emergency stop illuminated pushbutton switches

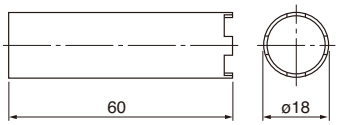
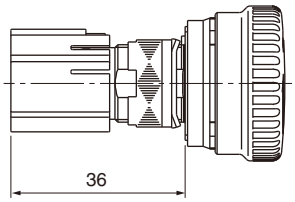
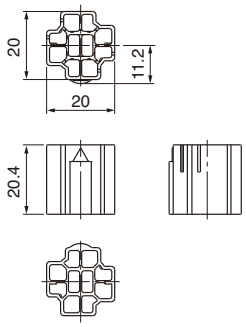
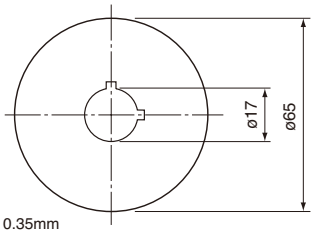
• AR16V0L



• AR16V1L



■ Accessories

Description	Type	Dimensions, mm
Wrench  (KKD07-257)	**AHX601 (AH9A601)** When installing a command switch on a panel, this tool is useful for tightening the switch firmly and efficiently.	
Terminal cover 	**AR6Y262** Protective cover for insulation between terminals and live parts. Note : Dimensions when connected with a switch (unit : mm)  • Wiring work should be made first , and attach the cover to the switch.	
Legend plate for AR16V emergency stop 	**AR6P719-*1,2** Legend / code (*1, 2) / Letter hight Black / 00 / — EMERGENCY STOP / 5A / 7mm • Plate color : Yellow • Letter color : Black	 Thickness : 0.35mm

■ Notes on use

Safety Precautions

Read the Operating Instructions carefully before mounting, wiring, operating, servicing, or inspecting the command switch. Make sure that the Operating Instructions is delivered to the final user of the command switch.

• The safety precautions are classified into two levels, "**WARNING** and **CAUTION**", with meanings described follows.

⚠WARNING: Indicates a potentially hazardous situation, which, if not avoided, could resuit in death or serious injury.

⚠CAUTION: Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury and/or damage to the equipment.

An item described under "**CAUTION**" may resuit in a serious accident, depending on the situation.

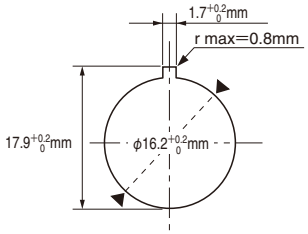
⚠WARNING

- Do not touch or approach any live part while power is supplied. An electric shock or burning may result.
- Be sure to turn off the power before mounting, dismounting, wiring, or inspecting, the product.
  An electric shock, burning from short-circuiting, or equipment malfunction may result.

⚠CAUTION

- Wire the product according to the wiring instructions in the Operating Instructions. Make sure that the size of the wires is suitable for the voltage and applied current.
  The wrong wiring may result in fire, accidents, or malfunctions.
- Treat the product as industrial waste when it is to be discarded.

■ Panel cutout (mm)

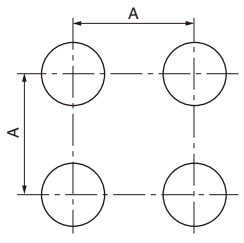


■ Applicable panel thickness

The applicable panel thickness is 1 to 6 mm. When the terminal cover (AR6Y262) is used, however, the applicable panel thickness will be 1 to 3.2 mm.

■ High-density mounting

The following minimum mounting pitch applies to high-density mounting.



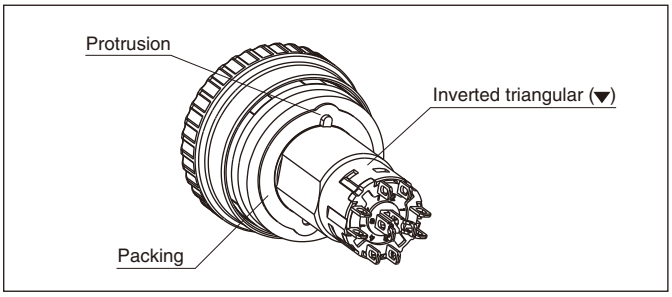
Type	Dimension A
AR16V0□	41mm min.
AR16V1	45mm min.
With AR6P719	65mm min.

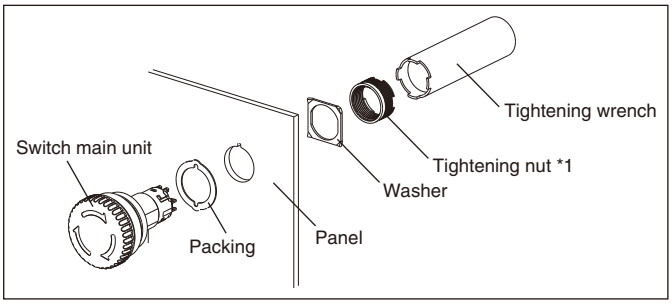
Note : Detemine the mounting pitch by taking the operability and wiring workability into consideration.

• Installation on panel

As shown in the figure below, insert the switch main unit into the panel cutout from the front of the panel with the top of the switch main unit (marked with an inverted triangular) facing upward. Then, use a tightening wrench (AHX601) and secure the unit with a washer and tightening nut from the rear of the panel.

Note : The proper tightening torque is 0.6 to 1.0 N · m.



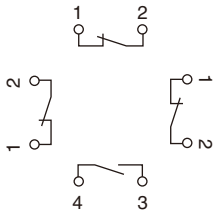
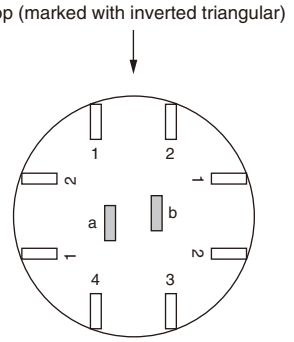
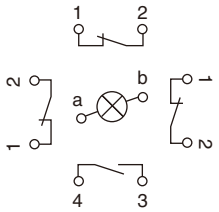


*1 : Do not use pliers or other improper tools tighten the nut, and do not tighten it excessively, or the nut may be damaged or switch may malfunction.

■ Wiring

- The wiring to this switch must be soldered. Keep the following items in mind when soldering.
- Type of solder : Use resin-core solder.
- Use a soldering iron with a maximum power consumption of 60W (350°C) within five seconds. Make sure that the terminals is free of tension during soldering. Also, do not deform the terminal.
- Lead-free solder has a high melting point, but the specific melting point depends on the type of lead-free solder. This may cause difficulty in soldering. Be careful not to overheat the solder if a soldering iron with a large soldering tip or a large heating capacity is used. Keep in mind that overheating the solder may resuit in product malfunctioning.
- Connectable wires
  One Solid wires with a maximum diameter of 1.0mm
  One standed wire with a maximum area of 0.75 mm^2
- For wiring to adjacent terminals, use the terminal cover (AR6Y262) to prevent short-circuit, or an insulation tube to assure isolation. Care is necessary when two wires are connected together or a large quantily of solder is applied. In addition, keep in mind that overheating the tube may result in product malfunctioning if a heat-shrinking tube is used.

• Terminal arrangement

Model	Circuit diagram (example)	Terminal arrangement (view from the terminal (back) side)
Emergency stop pushbutton switches		
Emergency stop illuminated pushbutton switches		

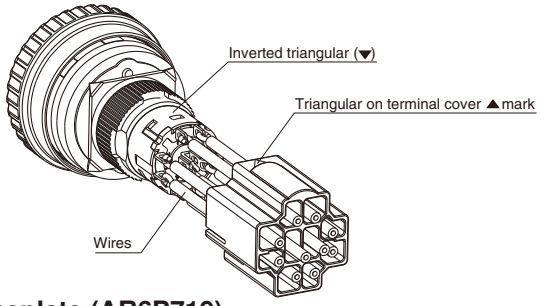
Terminals 1-2 : b (NC) contact terminals
Terminals 3-4 : a (NO) contact terminals
Terminals a-b : Lamp terminals

Note : If NO contacts are uesd in the contact configuration, they will be on the top of the unit (marked with the inverted triangular) and on the opposite side, regardless of the number of contacts.

■ Terminal caver (AR6Y262)

• Combination

The terminal cover must be attached in the correct direction. Make sure that the triangular on the terminal cover is aligned with the inverted triangular on the top of the unit. Also, when wiring the switch, check the alignment of these triangles and insert the wires correctly through the corresponding holes in the terminal cover.



■ Nameplate (AR6P719)

• Precautions

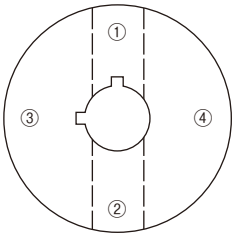
The nameplate must be attached. Attach the nameplate to an appropriate part, such as the panel, after removing the paper from the back of the nameplate.

Before attaching the nameplate, claen the surface to which the nameplate will be attached with alcohol.

The nameplate may come off if the surface is dirty or oily.

• Attachment Procedure (Example)

Remove portions ① and ② from the center of the nameplate, aligh the nameplate with the panel cutout, and lightly press on the front surface of the nameplate to attach it to the panel. Then remove portions ③ and ④ , and press on the entire front surface of the nameplate to complate attaching it to the panel.



■ Others

Operation

- Do not hit or flip the button, or the button may be damaged. Be sure to operate the button by hand.
- To unlock the switch, turn the button approximately 45° clockwise (in the direction of the arrow) or pull out the button. Do not operate or handle the button with excessive force.
- Do not lock the emergency stop pushbutton switch during normal use. Push and lock the switch only in an emergency.

Storage and Usage Locations

- Be sure to use and store the product within the rated ambient temperature and humidity ranges.
- Although the product resists ordinary cutting oils and coolant oils, do not use the unit in places where special oils may be sprayed onto the product.
- If dusts or filings accumulate in the gap between the button and the frame, the switch may fail to operate normally.
- This switch are for indoor use. Make sure that the product is not exposed to direct sunlight.
- Do not use the product in the places thet are subject to the adverse effects of ozone or corrosive gases.

■ Mass

(g)

Type	1NC	2NC (1NO+1NC)	4NC (1NO+3NC)
AR16V0R	19.0	19.4	20.0
AR16V1R	21.1	21.5	22.1
AR16V0L	19.7	20.1	20.7
AR16V1L	21.8	22.2	22.8

⚠ Safety Considerations

- Operate (keep) in the environment specified in the operating instructions and manual. High temperature, high humidity, condensation, dust, corrosive gases, oil, organic solvents, excessive vibration or shock might cause electric shock, fire, erratic operation or failure.
- For safe operation, before using the product read the instruction manual or user manual that comes with the product carefully or consult the Fuji sales representative from which you purchased the product.
- Products introduced in this catalog have not been designed or manufactured for such applications in a system or equipment that will affect human bodies or lives.
- Customers, who want to use the products introduced in this catalog for special systems or devices such as for atomic-energy control, aerospace use, medical use, passenger vehicle, and traffic control, are requested to consult with Fuji Electric FA.
- Customers are requested to prepare safety measures when they apply the products introduced in this catalog to such systems or facilities that will affect human lives or cause severe damage to property if the products become faulty.
- For safe operation, wiring should be conducted only by qualified engineers who have sufficient technical knowledge about electrical work or wiring.
- Follow the regulations of industrial wastes when the product is to be discarded.
- For further questions, please contact your Fuji sales representative or Fuji Electric FA.

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